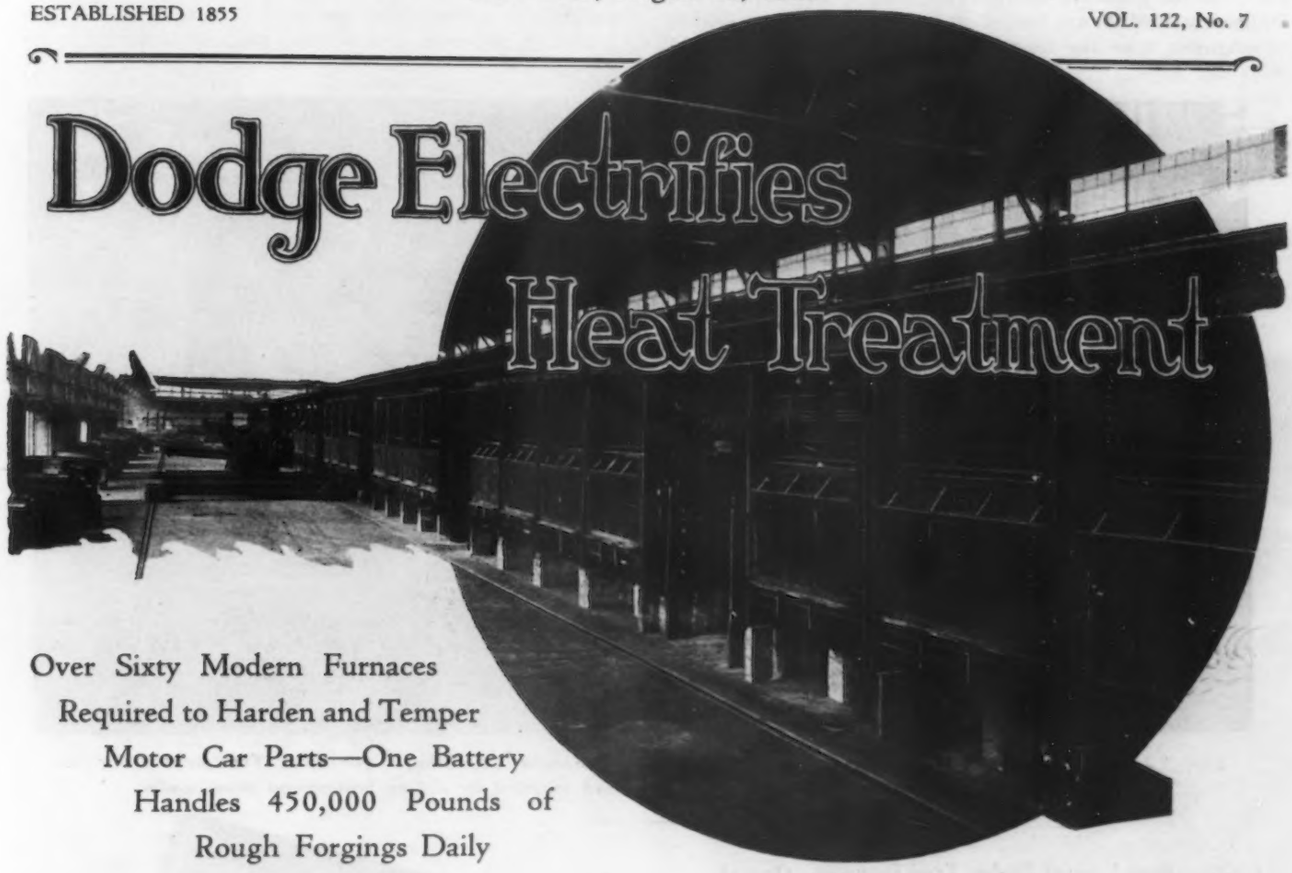
THE IRON AGE

New York, August 16, 1928

ESTABLISHED 1855

VOL. 122, No. 7

Dodge Electrifies Heat Treatment



Over Sixty Modern Furnaces Required to Harden and Temper Motor Car Parts—One Battery Handles 450,000 Pounds of Rough Forgings Daily

HEAT treating operations on parts used in the manufacture of motor cars by Dodge Brothers, Inc., Detroit, are now with only a few minor exceptions done in electric furnaces. New equipment of various continuous and automatic types includes over 60 furnaces, drawing a total current of 11,400 kw.

All carburizing is done in two types of electric furnaces, to be described fully in a later article. Among the more interesting heat treating operations in the plant, because of the methods and types of furnaces used, are the annealing and hardening of tranmission gears and the hardening of rear axle ring gears, a subject worthy of treatment in the third paper of this series.

The Dodge company adopted electric furnaces with a view of improving the quality of its product, closely controlling the temperature, reducing plant maintenance, improving working conditions by cutting down smoke and heat, reducing rejections, and simplifying the automatic operations. Three years' operations by some of the furnaces are said by those in charge to have fulfilled the expectations concerning control and uniformity of the product. Maintenance costs have been materially reduced because no excessive temperatures exist in any portion of the furnace.

Dodge has two separate heat treating departments, Plant No. 1 for finished machine parts, and Plant No. 2 for forgings. The latter will be described first. Many of the heat treated forgings undergo further heat treating operations in Plant No. 1 after machine operations are completed. Rejections in Plant No. 2 for heat treating forgings, it is stated, do not exceed 1 per cent.

No. 2 plant is particularly well arranged. The forge shop is located in a nearby parallel building and the heat treating equipment is so placed that there is a direct flow of work from the forge through the heat treat building to the machining department on the opposite side.

Unique Charging Devices

All furnaces for normalizing, quenching and drawing forgings have a combined capacity of 450,000 lb. every 24 hr. Their connected load is 7500 kw. To do this work there are 32 box type furnaces installed (20 for quenching and 12 for annealing), six pusher type furnaces for drawing and normalizing, and two pusher type furnaces for annealing gears.

Box type furnaces were supplied by the Electric Furnace Co. and are built in batteries of four. Each battery requires a floor space of 29 ft. 6 in. by 10 ft. 3 in.; the furnace hearths are each 5 ft. 6 in. by 8 ft. 6 in. As clearly shown in the head piece the cast iron door frames, structural steel members and masonry are supported on concrete piers. This places the furnace floor so high that the quenching tables do not need to be placed in pits. The outer furnace walls carry 4½ in. of brick and 13 in. of insulation; there is also 11½ in. of insulation between the individual furnaces in each battery. The hearth floor consists of three alloy plates locked at one end and an alloy steel wall

10 in. high. The floor is supported by fire brick standing between the heating elements.

Thus the metal floor and sides form an open-top trough, and heat is transmitted from the glowing electrical ribbons through the alloy bottom without much drop in thermal gradient, and from ribbons rung on the roof radiating direct. Heating elements of the T grid type are supported from the roof by brick and alloy clamps, and beneath the alloy floor they rest on fire brick.

As the parts are delivered from the forge shop, approximately 1000 lb. are loaded on a slide bottom tray slightly narrower than the furnace hearth. As shown in Fig. 1, these trays are placed on stands at one side of an open aisle at about the same height as the furnace bottom, so the charging machines can pick them up readily. The frame of the tray is made of channel section, and has a heavy cast steel end provided with a T slot for the charging peel. Handling is done by an Alliance Machine Co. electrically operated charging machine having 3000 lb. capacity. This machine has a T shaped casting on the end of the peel which engages with the corresponding slot on the tray head and is provided with a lock. This is for lifting the weight. A screw under the peel carries a nut, a projection on the under side of which engages in a hole in the

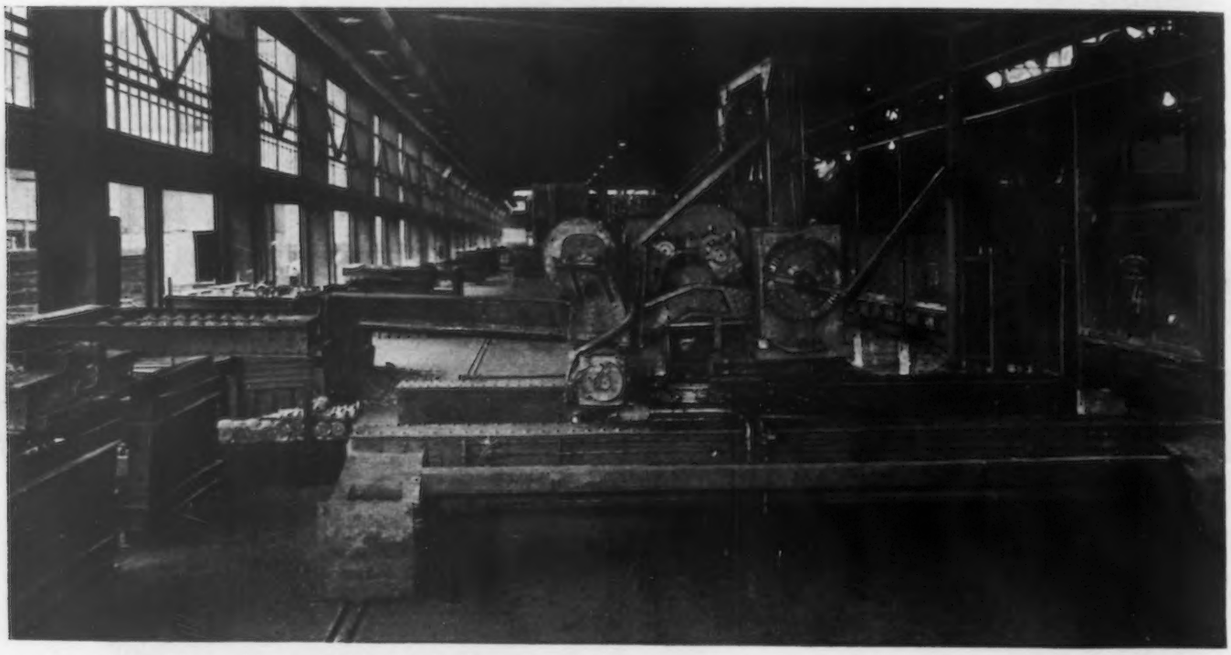
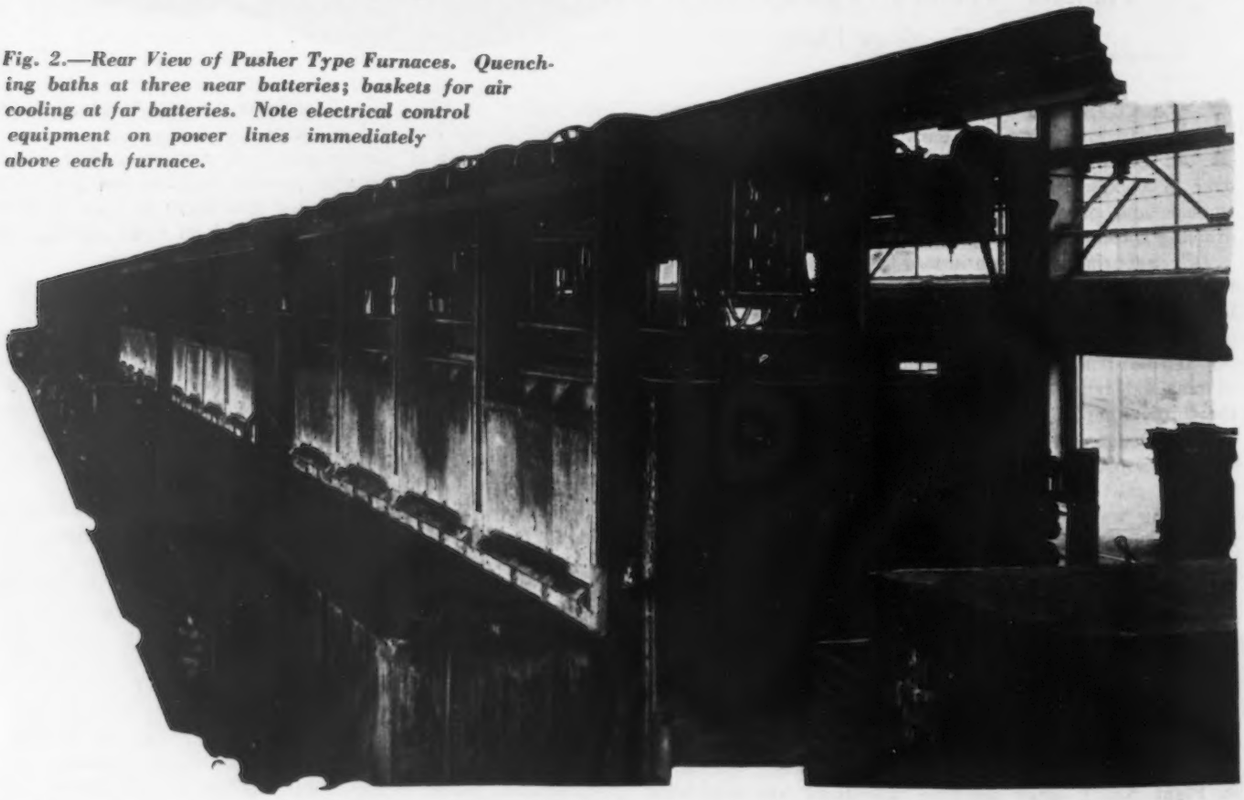


Fig. 1.—Charging Machine Picking up a Tray Loaded with Forged Crankshafts for Heat Treatment Prior to Machining. Trays are loaded into furnaces at right and emptied by sliding bottom out from under

Fig. 2.—Rear View of Pusher Type Furnaces. Quenching baths at three near batteries; baskets for air cooling at far batteries. Note electrical control equipment on power lines immediately above each furnace.



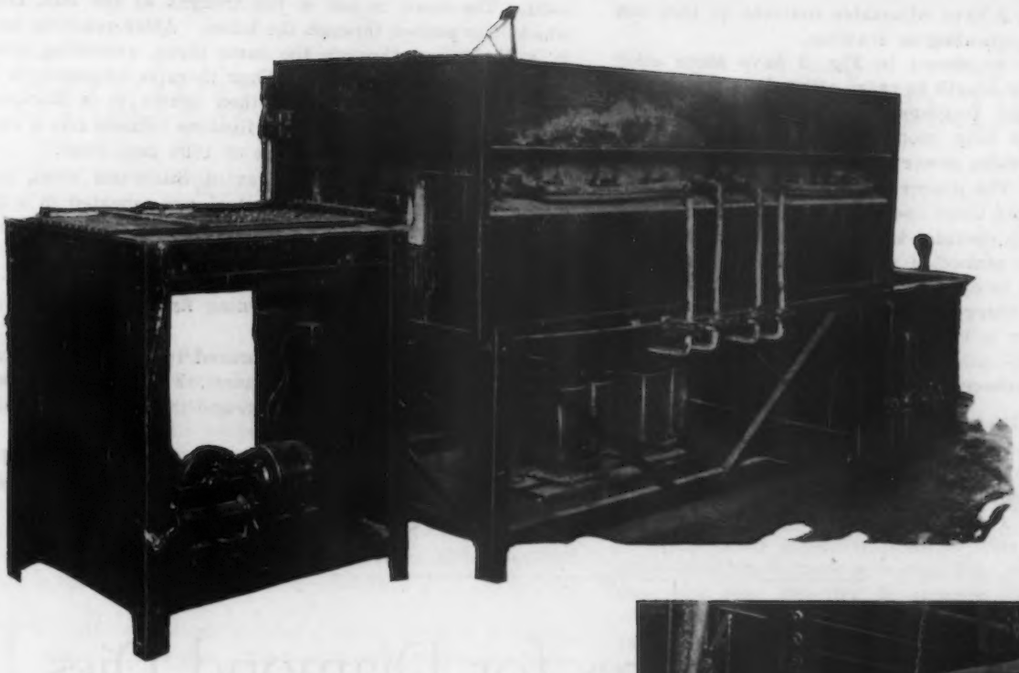


Fig. 4.—Tube Furnace for Connecting Rod Bolts. Work is pushed through tubes and quenched without contact with outside air. Note electric transformers under furnace and simple pusher at left

sliding bottom of the tray. This is for pulling the tray bottom out from under the load.

After the charging machine makes connection with the tray it faces about 180 deg. and moves along its track to a position in front of the furnace to be charged. Both furnace doors are raised and the charger advances, pushing the hot forgings remaining on the furnace hearth out the discharge door at the back. When the new load is in place the charging machine operator switches on the motor controlling the screw, and the bottom of the tray is withdrawn, thus depositing the cold forgings in correct position on the furnace hearth. The peel is then raised, lifting the tray above the charge, and withdraws it from the furnace. Then both doors are closed.

The entire time of loading and unloading is 30 seconds, during which the drop in furnace temperature is approximately 50 deg. Fahr.

Each furnace is connected with one phase of a 220-volt, 60-cycle, 3-phase line, and takes 154 kw. when the furnace is heating up from cold. An input of 135 kw. is required to maintain operations at 1650 deg. Fahr.

As shown in Fig. 2, quenching tanks are placed immediately behind three batteries of furnaces. Hot metal pushed out of the furnace falls into a submerged basket, and is later handled by an overhead electric traveling crane. The quenching solution (a caustic solution of 10 deg. Baume) is pumped through the tanks at the rate of 1000 gal. per min. Some furnaces do not have these tanks; a basket is placed below the door and collects parts which are to be cooled more slowly.

Most of the chassis forgings are heat treated in these box type furnaces. For example, 28 axles or 40 camshafts are placed on a tray and remain in the furnace 1 hr. at 1650 deg. The tray holds 16 crankshafts, which are in the furnace 2 hr. at 1550 deg. Heating times and temperatures naturally vary with the purpose intended and the chemical composition of the steel.

All work that is quenched after heating in the box type furnace goes to drawing furnaces placed just across the aisle from the quenching tanks. Such work includes axles, crankshafts, connecting rods, spring clips, hub forgings, and flanges, gear shift levers and brake levers. Crankshafts are drawn at 1090 deg. Fahr. and are restruck under a 5000-lb. board hammer as they are delivered from the continuous furnace. Ring gears are normalized at 1700 deg. Camshafts, drive pinions, and ring gears are given only an annealing operation at this stage of the process. They are cooled in the air, leaving them soft for machining. Subsequently they are carburized and hardened.

Fig. 3.—Pusher at Charging End of Continuous Normalizing Furnace. Pans of parts are lifted by tongs and overhead pneumatic cylinder

Six pusher type continuous furnaces are installed in Plant No. 2 for drawing and normalizing forgings. Four are 25 ft. in length and two for higher heats are 15 ft. in length. Two produce 5200 lb. per hr. at 1350 deg. with a power input of 430 kw. Two furnaces have an output of 5200 lb. per hr. at 1350 deg. with a power consumption of 570 kw. Each of a pair of double-chamber recuperative furnaces installed in another department to redraw crankshafts after finish machining has a capacity of 3300 lb. per hr. with two 150-kw. power zones. Two of the fur-

naces in Plant No. 2 have adjustable controls, so they can be used for either annealing or drawing.

These furnaces as shown in Fig. 3 have three alloy tracks running their length to carry alloy shoes which support trays for light forgings, or crankshafts and other larger forgings. A 5-hp. motor through a reduction gear and bell crank provides power by pushing on the shoes on the charging end. The pusher motor is actuated by a time clock so set that both doors open simultaneously. The clock closes a relay which operates the motor driven doors. The door mechanism is connected with the pusher mechanism, causing the pusher to operate one stroke, or approximately 15 in. While one charge is being pushed into the furnace at one end, another is being discharged from the opposite end.

Tube Furnace Protects Bolts from Air

Five electric furnaces are provided for heat treating miscellaneous parts of the Dodge cars. Brief notes on these are as follows:

An interesting device is shown in Fig. 4. It is a 50-kw. tube-type Hoskins furnace for hardening connecting rod bolts. The work is put in ten troughs at the left, from which it is pushed through the tubes. After reaching heat it is discharged through the same pipes, extending down into an oil quenching tank. Thus there is no exposure to the air. Hardened bolts are then drawn to a Rockwell hardness of B-92 to 100. This Hoskins furnace has a two-zone control and a temperature of 1600 deg. Fahr.

The heads of exhaust valves of Silchrome steel, and intake valves of chrome nickel steel, are reheated in a 35-kw. continuous furnace to a temperature of 1650 deg. previous to an operation in a coining press.

A rotary furnace of 125 kw. with an 18-in. hearth is used for normalizing and hardening flywheel starter ring gears.

Rear axle hub flanges are brazed to the tubes in two 12-in. rotary hearth 110 kw. furnaces. These furnaces operate at a temperature of 1750 deg. and the work is in for 20 min.

Some castings such as flywheels, manifolds and valve stem guides are annealed in four Rockwell continuous oil-fired furnaces.

Alloys as Substitutes for Diamond Dies

Hard Tungsten Products for Wire Drawing Cost Less and Last Longer, According to German Claims

BY ALFRED DREBES*

TESTS to replace diamond dies for drawing by other materials go back to the war time when the price of diamonds constantly increased. Work in this direction led to the production of metal alloys which, while not possessing all the properties of the diamond, were suitable for the wire industry. They increased production and, through the obtaining of exact sized wire with smooth surface, improved the quality and increased the possible usefulness of the wire. Also the increasing introduction of machines making many passes affords an unusual opportunity for these materials as substitutes for diamonds. It is not too much to say that these materials have a future, not alone as substitutes for the diamond but also to replace the ordinary drawing dies made of steel and iron alloys.

In producing these artificial die materials, alloys of tungsten, titanium, iron, chromium, cerium and carbon were first investigated. It has been found that the most suitable alloy contains 75 to 95 per cent of tungsten and 5 to 25 per cent cobalt. Such alloys are produced from a mixture of tungstic acid and oxide of cobalt, powdered aluminum being used as a reaction material. The alloy is then cast into shape.

Another kind of hard metal is made by sintering hard metal alloys containing tungsten carbide with about 3 to 7 per cent carbon and metals with fairly low-melting points, such as tungsten, nickel, cobalt or iron. These additional materials do not exceed 10 per cent in amount. Also these alloys contain tungsten as the principal constituent amounting to at least 80 per cent.

Dies from these sintered and pressed materials are harder throughout than the cast material. The principal requirement for the dies is not hardness alone but absolute uniformity of the material, which must also be free from blowholes as well as uniform in other properties. Before being used the dies should be carefully examined with a magnifying glass to see if they are free from defects. The die opening must exhibit a highly polished surface and no roughness or else the wire will tear and crack.

The advantage of the hard metal dies compared with the diamond is, first, their decreased cost. Further, there is the constant danger of the diamond cracking during use. Compared with iron and steel dies the hard metal also offers great advantages, such as considerably increased life; also the wire remains much more exact in diameter, has a more polished and smoother appearance, and the speed of drawing can be considerably increased.

Drawing through hard metal dies is not different from drawing in diamond or steel dies. The material to be drawn should be previously well softened. The reduction should not be too light. For soft iron, brass, copper and aluminum wire a reduction of about 12 per cent is recommended. For harder wires, such as steel, bronze, hard copper and brass about 10 per cent, and for very hard wires, such as tungsten, molybdenum and nichrome, about 7.5 per cent. The first drafts after annealing can be about 2 per cent greater. The usual lubricating agents should be used and frequent cleaning of the dies during use is necessary, no great difference being recommended to ordinary practice. These hard alloy dies should be carefully polished, which may be conveniently done on a needle polishing machine.

*Herborn in Hesse-Nassau, Germany.

Wages in the United States reached their highest point in 1920 with an index of 234 as an average hourly rate, using 1913 (100) as the base year, with a sharp downward trend to 1922 and after that a gradual rise, so that in 1926 wages were 129 per cent higher than in 1913. This is shown in a compilation made by the Bureau of Labor Statistics, Department of Labor, Washington, for the period 1840-1926, and published in the February number of the *Monthly Labor Review*. All lines of employment except agriculture are covered.

Studying Gas to Learn Conditions

Watching Formation of Graphite—Some of the Conditions Which Produce Rapid Driving and Much Iron Are Analyzed

BY WALLACE G. IMHOFF*

[That the color of the smoke end of the burning gases rising from the open-top blast furnace indicates the character of the metal was shown in the first instalment of this article. The second instalment carried the story forward, through tracing conditions in a particular cast of metal as a typical illustration of ideal conditions for lime combination with sulphur to form calcium sulphide. Conditions giving high production were entered into, one criterion being the fluidity of the iron and the slag, together with a high hearth temperature.—EDITOR.]

THESE conditions carried further produce a heavy, bluish purple gas. The hearth temperature has fallen much lower and the fusion zone has come down into the hearth. The temperature of the hearth has fallen so low that the iron when cast, instead of being a bright yellow color, is a cold orange. It is glistening and shining, owing to the supersaturation of carbon. When it is cast, the excess carbon in the iron, under reduced pressure and atmospheric temperature, is thrown out in the form of graphite and fills the iron runner to a depth of 4 in. The analyses of the iron and slag are given below:

	IRON					SLAG	
Silicon	0.94	0.93	1.02	0.93	0.81	Silica	36.14
Sulphur	0.033	0.033	0.036	0.030	0.030	Alumina	10.68
Phosphorus	....	....	0.147	....	....	CaO	42.60
Manganese	....	....	1.06	....	....	MgO	8.37
						Fe	0.45
						S	1.60
Silicon	0.61	0.90	0.87	1.06	1.02	Silica	36.08
Sulphur	0.039	0.033	0.031	0.027	0.028	Alumina	10.52
Phosphorus	....	....	0.151	....	....	CaO	43.10
Manganese	....	....	1.02	....	....	MgO	7.87
						Fe	0.63
						S	1.56

These two sets of analyses show quite a contrast with the analyses for hot, yellow gas. The silica is 36.14 per cent, showing that the hearth is much colder. The sulphur is 1.56 instead of 2.17 per cent, another fact which verifies the statement that the hearth temperature is much lower; and the iron in the slag has risen to 0.63 per cent.

It is interesting to note that the first example for hot, yellow gas has the tendency to promote the formation of graphite by having high lime, a low fusion zone and a hot hearth. The graphite in the second case, however, comes from an entirely different cause, a decrease of hearth temperature. In the first case the iron is thick and mucky, due to the fact that the carbon has been removed in the form of graphite. In the second case the iron is thin and fluid, but is simply cold and oversaturated with carbon, due to a falling temperature. Hence when it comes out of the furnace into new conditions of pressure and temperature it is supersaturated, and therefore large quantities separate out as graphite.

In the former case, in the furnace hearth there is a tendency for the iron not to take up carbon; in the latter case, there is a tendency for the iron to take up all the carbon possible. The first condition supplies large quantities of carbon for the gas; the second condition takes away the carbon from the gas and holds it in the iron. The excess carbon gives a hot, yellow gas; the shortage of carbon gives a thin, cold, blue gas.

Wide Variations in Heat Value of Gas

Many other examples could be given to illustrate the conditions which produce heavy, hot, yellow gas and cold, thin, blue gas. Practical furnacemen know that there is a wide variation in the heating value of the gas from time to time, since it is necessary in some cases to fire the boilers with coal to keep up steam. This practical condition therefore indicates that there must be a change in the composition of the gas.

Studies of the reactions going on in the iron blast furnace and the gas composition, etc., have been made by S. P. Kinney, P. H. Royster and T. L. Joseph.† These investigations were carried out on a 300-ton furnace, making foundry iron, operated by the Central Iron & Coal Co., Holt, Ala.

Study of the results given in this paper shows that blast furnace gas is made up essentially of N, CO, CO_2 and small quantities of hydrogen, H. They show also not only that the composition of the gas varies across the furnace in the same plane, but that there is a variation in the gas at different planes in the furnace. The change of composition from top to bottom as given in Table II, page 8, of their study, shows an increase in the volume of CO from 28.1 per cent in the top gas to 34.1 per cent in the bosh gas, and a decrease in the volume ratio of CO_2 from 9.9 per cent in the top gas to 0.0 in the bosh gas. This shows the change of CO to CO_2.

The practical side of blast furnace gas has been ably covered by Herman A. Brassert in his paper (pages 47-54), "Modern American Blast Furnace Practice," read at the sixth general meeting of the American Iron and Steel Institute, New York, May 22, 1914. Charts showing the "Effect of Coke Rate on Analysis of Blast Furnace Gas," "Effect of Coke Rate on Production of Blast Furnace Gas," "Relation of Tons of Iron Per Day to Coke Rate," "Effect of Tons of Iron Per Day on Amount of Gas Produced Per Minute" and "Effect of Tons of Iron Per Day on Amount of Gas Produced Per Ton," are given. The gas analysis shows:

	Per Cent		Per Cent
CO	25.8	CH_4	0.2
CO_2	13.6	N	57.4
H	3.0		

The most significant fact, as shown in his Chart 3, is that, the higher the tonnage of iron produced in 24 hr., the lower the coke consumption to the ton. The question which immediately arises is, "What are the conditions that produce a ton of iron on 1700 to 1900 lb. of coke; how can these conditions be obtained?"

The most important ingredients of the gas are CO and CO_2. Forsythe‡ shows the percentage by volume from the top of the furnace to the bottom for each of these. There is a direct relation between the coke used, tonnage produced and gas formed. An explanation will now be offered for the conditions which give high production, low coke con-

*Metallurgical Engineer, Sixty-second Street and Allegheny Valley Railroad, Pittsburgh. This is the final of three instalments of the article, the first having appeared in our issue of June 14, page 1686, and the second, July 26, page 203.

†"Study of the Reactions in an Iron Blast Furnace." Reports of investigations, Department of Commerce, Bureau of Mines, Serial No. 2747, April, 1926.

‡The Blast Furnace and the Manufacture of Pig Iron, by Forsythe, page 189.

sumption and good gas; in other words, answer the above question.

Production depends primarily upon the rapidity of reduction of the iron ore to metallic iron and the smooth, rapid driving of the furnace. If the conditions can be discovered which control these two factors, then we have discovered the conditions which will continually produce a high tonnage with low coke consumption.

Without entering into detail, a brief discussion will be given of some of the conditions which give rapid driving. These are:

1. Low fusion zone
2. Moderate use of lime
3. High hearth temperature
4. Proper wind
5. Proper stove heat control
6. Clean raw materials
7. Right burden
8. Good condition of equipment

A low fusion zone is of prime importance in obtaining a high production of pig iron. The main cause of raising the fusion zone up in the mantle, or higher into the middle of the furnace, is continued use of cold air. Besides being a disturbing factor in the driving, cold air upsets those chemical and metallurgical reactions going on inside the furnace which gives high production. Instead of using cold air the wind should be slightly increased; this will increase the tonnage instead of decreasing it.

Too high wind will raise the fusion zone. This will be reflected in the driving and the top heat. Practice soon establishes the proper amount of wind to use. The use of cold air should be avoided whenever possible, as it eventually starts the furnace to slipping and brings about irregular driving, which lowers production.

Lime Practice Causes Some Difficulties

The proper use of lime is a difficult feature to understand in blast furnace practice. It is essential to be able to distinguish whether the furnace really needs lime, or is lean simply from being cold. The slag should always be kept fluid, other conditions being right.

With the proper hearth temperature, the lime will combine with the sulphur and the silica will be reduced to silicon and then go into the iron. A hot hearth is an absolutely essential factor for these two reactions to take place. If the fusion zone is down in the hearth, and the hearth is cold, disastrous results may be encountered if there is too much lime on the burden. There is no reserve of heat in this case and no remedy except to slow down the revolutions of the engines. This reduces production.

By proper wind is meant that volume of wind which will give the highest production with the smoothest driving. The temperature of the hearth should be controlled from the engine room, and not by the use of cold air. Cold air is a trouble maker. If the hearth is too hot, the logical procedure is to cool it down by getting a larger tonnage, not by decreasing the tonnage. The running of a furnace by this method requires greater skill, but pays well in the increase in production obtained.

Control of stove heat is another means of raising or lowering the hearth temperature. The best practice is to use the full stove heat all the time. An average, uniform heat is the ideal; there should be no violent fluctuations. As previously stated, the cold air by-pass is a trouble maker and should be used only as a last resort. If the furnace is too hot, increase the wind slightly and get a rich return in more pig iron.

Importance of Good Raw Stock

Clean raw materials are essential, also, to maintaining high production continuously. Fine, dirty coke, or dirty limestone, if used long enough, will tighten up the stock and disturb the proper metallurgical reactions essential to high production.

Proper mixture and proper proportions of raw materials are also important in obtaining the greatest output. Too much ore on a hot furnace will make it drive fast, but care should be taken it does not drive itself cold. Too little ore will tighten the furnace up and slow down driving. The gas in the former case will change from a hot, yellow gas to a thin, blue gas; in the latter case, the gas will be a bright yellow color.

It is hardly necessary to mention the fact that all equipment must be in good working order, to obtain high production. Delays in the skip house, on the furnace, in the engine room, reduce the tonnage of iron produced in 24 hr.

Stops or shutdowns for any great length of time affect the character of the gas. When it is known ahead of time that the shutdown will be for some time, extra coke will be put in. This furnishes an abundant supply of both heat and carbon and the gas is usually a bright, yellow color when this extra coke comes down. The two prime factors in producing heavy, yellow gas are an abundance of lime and coke. With the fusion zone down in the hearth, these factors set up conditions which promote the formation of large quantities of graphitic carbon, and an abundant supply of carbon for the gas.

Educational Work for Foundry to Be Undertaken by A. F. A.

FUNCTIONS of the recently organized educational committee of the American Foundrymen's Association are outlined in a report prepared by the former president, S. W. Utley, Detroit Steel Casting Co., Detroit, and approved by the board of directors. Members of the committee will be appointed soon.

As outlined in the report, "the object of this committee shall be to originate and disseminate to engineers and manufacturers information tending to produce a better realization of the value of the foundry industry and the possible use of castings in all kinds of manufacturing processes." Its function is to be purely educational and it shall not have as its direct object the merchandising of any particular kind of casting or the creating of a specific market for any material. It will work with the various trade associations connected with the foundry industry. No direct advertising will be done, this to be left, as now, to the various individual companies, but it hoped to persuade manufacturers to include in their advertising copy information which will help to tell the story of the foundry industry.

Publicity matter will be worked up for publication by the technical press and to some extent by the daily press.

Another function of the educational committee will be to furnish speakers for technical societies and for conferences at schools and colleges. Exhibits of motion pictures of the foundry industry are suggested as a feature of this work.

Furthermore, the educational committee hopes to "impress upon the buying public that there is more to a casting than a certain number of pounds of metal; that the character of the foundry, its technical control, its engineering ability and the ability of its organization is of as vital interest as the fact that it has a cupola or a furnace. The greatest drawback to the success of the foundry industry today is the poor quality of castings turned out by the unprogressive units, and the fact that the buyer considers the product of the well organized, progressive foundry on the same plane as the others. The bringing of this realization to the purchasing public should make membership in the American Foundrymen's Association much more sought after."

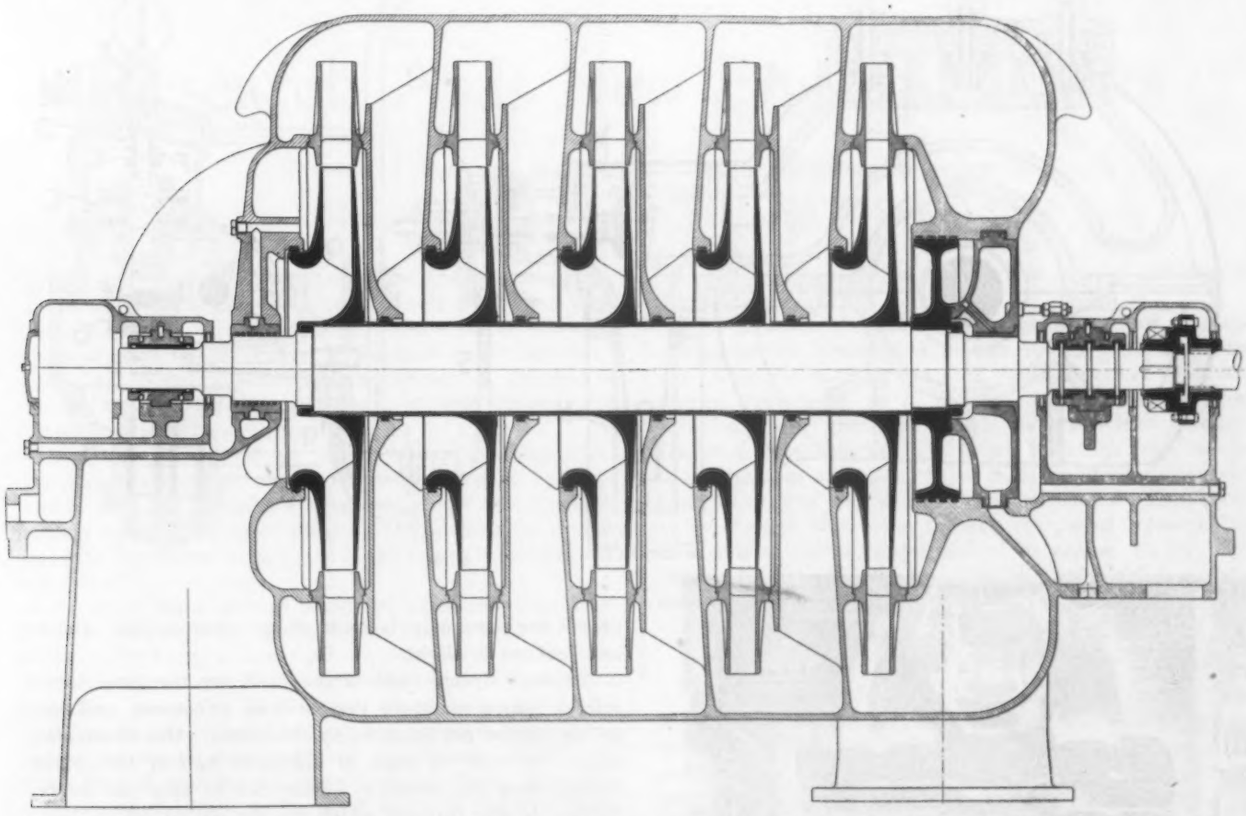
Brown, Boveri Blower at Braddock

New Turbo Unit at Edgar Thomson Works Applied to Blast Furnace of 750 Tons Daily Capacity—Cooling Water Required Only for Oil Coolers

AT the Edgar Thomson Works of the Carnegie Steel Co., Braddock, Pa., there has recently been put into service the first blast furnace turbo-blower of Brown, Boveri design to be installed in this country. The unit was furnished by the American Brown, Boveri Electric Corporation, Camden, N. J., which holds exclusive rights in this country for the manufacture of machinery to the designs of Brown, Boveri & Co., Ltd., Baden, Switzerland.

maximum operating load was specified as 60,000 cu. ft. a minute at a blast pressure of 30 lb. gage. In service the set has shown itself capable of delivering an inlet volume of 70,000 cu. ft. a minute at 30 lb. The operating speeds are conservative, ranging from about 2100 r.p.m. when delivering 50,000 cu. ft. at 18 lb. to 2700 r.p.m. when delivering 70,000 cu. ft. at 30 lb.

From the sectional view and the view of the lower half



Longitudinal Axial Section Through Blower Unit, Showing the Five Stages. Water cooling is not used

This is one of three new blowing units at the plant, as mentioned in THE IRON AGE of April 5.

The unit is of the four-bearing type, and consists of a five-stage, single-inlet, uncooled centrifugal blower direct connected by a semi-flexible claw type coupling to a combined impulse and reaction steam turbine, designed to operate with steam at 225 lb. per sq. in. gage and 150 deg. Fahr. superheat, exhausting into a vacuum of 28 to 28½ in. A light baseplate extends under the exhaust casing of the turbine and the adjacent bearing pedestal of the blower, the outboard pedestals of blower and turbine being provided with soleplates.

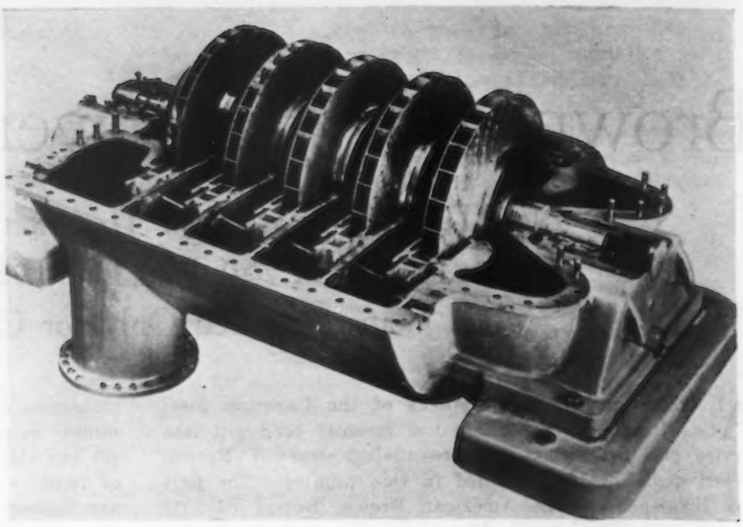
The set was designed to blow a furnace which has a daily capacity of 750 tons of pig iron. Accordingly, the

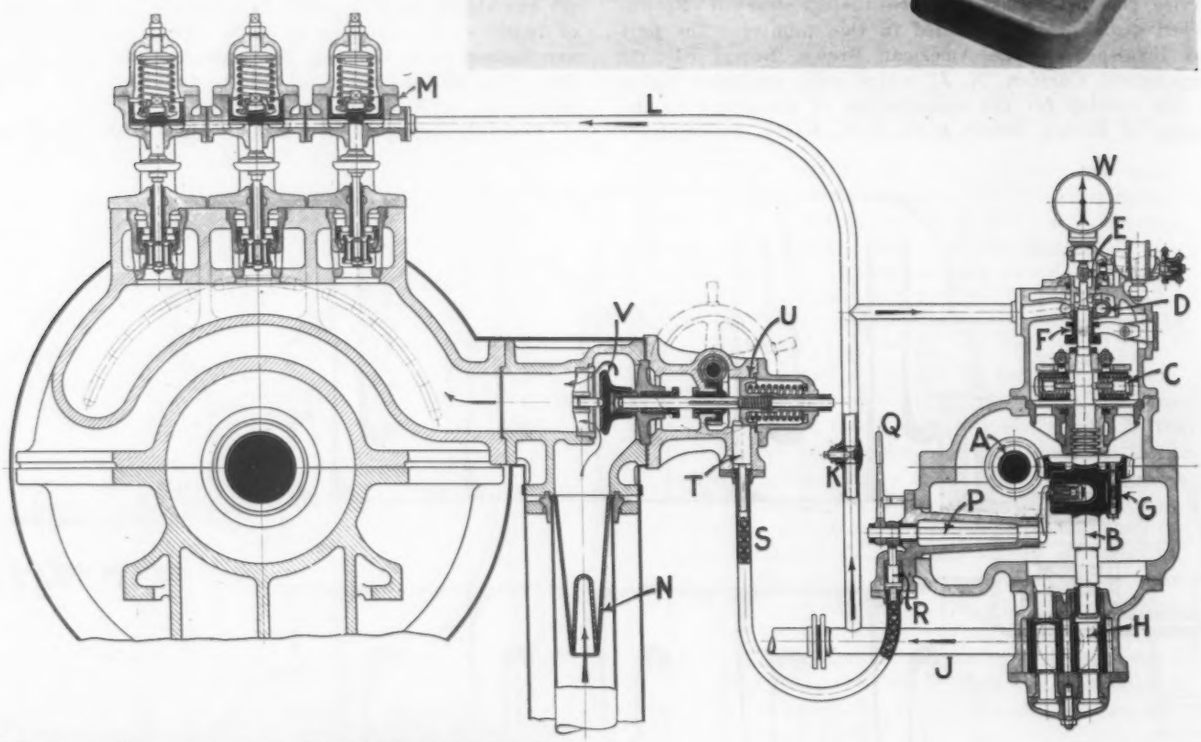
of the casing in course of manufacture an idea may be obtained of the design, which does not use water for cooling. The only cooling water required for the set is that for the oil coolers, two of which are furnished, connected in parallel, so that either one can be cleaned without shutting down the set.

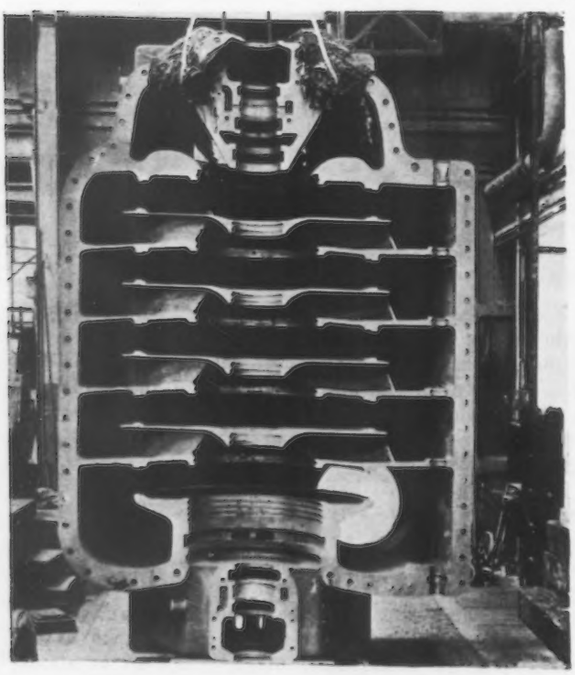
The blower rotor is handled by a special lifting device furnished to facilitate erection. There is a pressure-balancing piston mounted at the high-pressure end of the shaft. This piston balances the greater portion of the axial thrust of the blower, and also carries labyrinth glands. As can be seen from the section, the chamber after the piston may be connected to the inlet branch of the blower, or to the atmosphere. As a result, air at atmos-

OPERATION of the Governor of the Steam Turbine End of the Unit May Be Noted from the Center Illustration. For ease in tracing the functions of the mechanism the governor is shown misplaced, at right of the turbine

THE upper half of the casing, as cast and machined, is shown below, and the lower half of casing in position, with rotor in place at the right. This shows the makeup of the rotor stages. A special lifting device facilitates erection handling of the rotor







pheric pressure only is back of the shaft-sealing glands, and leakage is slight.

At the extreme right of the shaft are the three thrust collars, which maintain the rotor in alinement, and take up any thrust not balanced by the piston. One illustration shows the rotor in place in the lower half of the casing. Surrounding the impeller wheels can be seen the curved diffuser blades through which the air passes before being directed into the inlet of the next impeller.

Perhaps the most striking feature of the turbine is the speed-governing device. In the illustration the governor shaft has been misplaced to the right, for ease in tracing the functions of the mechanism. The vertical governor shaft *B* is worm-gear driven from the turbine shaft *A*. Oil under pressure for lubrication and for actuating the turbine nozzle valves *M* is supplied by the gear oil pump *H* mounted on the lower end of the governor shaft. The oil under pressure for governing is drawn through an adjustable needle valve *K*. The movement of the spring-loaded nozzle valves is dependent upon the oil pressure in the oil pipe *L*. This oil pressure is controlled by the governor by-passing more or less oil from the oil pipe *L*, decreasing or increasing the oil pressure under the nozzle valves.

Through the throttling action of the needle valve *K* the oil pressure in the governing system can vary without affecting the pressure in the lubricating system. Oil by-passed by the governor lubricates the governor shaft mechanism.

The arrangement is such that the turbine cannot be started before oil pressure is available to the bearings, nor before sufficient pressure has been built up thereafter to operate the nozzle valve system. In case of failure of oil pressure, either in the bearing or nozzle systems, the nozzle valves will close automatically, thereby shutting off steam admission to the turbine.

An independent over-speed safety governor *G*, by striking the arm of the trip shaft *P* turns the shaft and releases the pressure on the column of balls *S*. This trips the spring-loaded main steam valve *V*, which cuts off the steam supply to the turbine.

In addition, the set is provided with a constant-volume governor, tied in with the speed governor in such a manner that the action of the former is supplanted by the latter when in service. In connecting the volume governor, an additional pipe line is connected to the annular chamber *D* of the speed governor. In this pipe line is placed a relay-valve whose movement is controlled by a spring-backed diaphragm. This diaphragm is actuated by the differential pressure between a straight tube and a bent tube (Pitot principle) in the blower suction line. This differential pressure is a function of the volume drawn into the blower.

Any change in the volume will, therefore, alter the position of the diaphragm, and, consequently, the oil relay valve. More or less oil is by-passed by the valve, and, therefore, the oil pressure in the line *L* is varied, changing the position of the nozzle valve to admit more or less steam, thus varying the speed of the set. The diaphragm-relay unit, with a small amount of piping, is all that appears on the machine floor.

For slowing down the set when making a check or cast, the control sleeve *E* of the speed governor may be displaced, independently of volume governor and speed governor, by means of an electric motor controlled by a push-button, requiring no change in the setting of the volume governor. The control pillar carrying the push-button is located at a convenient point for the operator.

Research Aids New England Plants

Survey of Various Industries Discloses Efforts to Solve Manufacturing As Well As Marketing Problems

THE success with which many New England manufacturers are using research methods in developing new products and new uses for old ones is shown in the first of a series of reports on "Applying Research to Production," issued by the Policyholders' Service Bureau of the Metropolitan Life Insurance Co., in cooperation with the research committee of the New England Council.

The recent survey of the uses of research in New England industry made by the Metropolitan company in cooperation with the council disclosed that many New England manufacturers have been alive to the importance of research in developing established products and in introducing new ones.

Examples are presented under the headings "Improving Present Products," "Utilizing Waste Products" and "New Products for Today's Demands."

One striking instance is furnished by the Winchester Repeating Arms Co., New Haven, Conn., which maintains physical, chemical, metallurgical and ballistic laboratories and an experimental development department. The Morse Twist Drill & Machine Co., New Bedford, Mass., maintains a development laboratory in which new and improved tools are developed and tested before being manufactured in quantity. The Max Ams Machine Co., Bridgeport, Conn., went deeply into chemical research and succeeded in developing a gelatinous preparation which could be used instead of soldering to close the tops on tin food containers.

The Scovill Mfg. Co., Waterbury, Conn., brass manufacturer, adopted three methods for improving its product: first, by maintaining a uniformly high grade of metal; second, by constantly overhauling and renewing mechanical equipment; third, through continuous development work carried on through a research laboratory. A new type of road machine was developed through research by the Highway Products Co., New Bedford, Mass. The Max Ams Chemical Engineering Corporation, Bridgeport, builds equipment for the manufacture of rayon by all processes, and maintains an experimental plant in which rayon is actually manufactured, in an effort to develop and perfect this equipment.

The problem of utilizing waste products, New England manufacturers interviewed in this survey reported, often can be solved through research. The Rumford Chemical Works, Providence, R. I., discovered that by-products of phosphoric acid production could be made into excellent plaster building blocks. The Acme Wire Co., New Haven, found out that short lengths of wire, previously discarded, could be used as lead wire in radio condensers. The Graton & Knight Co., Worcester, through the use of research, has been able to utilize 75 per cent of its scrap. At the Winchester Repeating Arms Co. plant all wastes and scrap material and equipment are routed to a central salvage department.

Research on Market Conditions

A large number of New England manufacturers have used research methods in developing products to keep up with current market conditions. In the case of the Blanchard Machine Co., Cambridge, Mass., a by-product grew so popular that it became the principal product of that company. The Carr Fastener Co., Cambridge, Mass., developed a number of its successful products by research into market conditions. The laboratory is used by the American Writing Paper Co., Holyoke, Mass., in the development of paper for new uses. By using research to test out the insulating properties of seaweed, the product of Samuel Cabot, Inc., Boston, was developed. The Eastern Mfg. Co., Bangor, Me., has developed a device which automatically weighs paper or other material passing through the mechanism in web form. The Bigelow-Hartford Co., Thompsonville, Conn., through research, changed its products to keep up with the changing fashions in the rug industry, introducing also the first mats for "table throws." The Scovill Mfg. Co. also introduced side lines which have increased the business volume of the company and have afforded steady employment.

Old Japanese Blades as Sharp

A DEVICE for determining the sharpness and durability of a cutting edge has been patented by Prof. K. Honda. It consists of a fixture which holds the blade, edge down and strictly horizontal, upon a pile of paper strips, 1 cm. wide. A definite load (1500 gm.) can be applied to press the blade against the paper pile, and then by lever motion, the blade is drawn back and forth 2 cm. The "sharpness" is measured by the number of sheets of paper cut during this operation, and the "durability" by the number of cuts required to reduce the sharpness by 50 per cent of its original value. Such values have only a relative meaning, so it is only necessary to use one kind of paper for a series of comparisons.

Cutting by pressure alone is done by wedge action; hence the sharpness determined without drawing back and forth is a function of the angle at the edge. This angle is easily determined by pressing the edge lightly on a piece of lead; the lead is then cross sectioned and the impression measured at 400 magnifications on the focusing plate of the camera. Such impressions also show the amount of wear on an edge after testing.

Before testing, the blade is honed and then finished on a microtom polishing device, until the edge is free from feathers, and when viewed sidewise at 400 magnifications has no wavy undulations nor nicks deeper than 0.02 in.

Tests made in this way on various pieces of cutlery by the inventor, and described in Science Reports of the Imperial University, Sendai, Japan (October, 1927), are summarized in Table I.

When corrected for edge angle, these data convince Prof. Honda that the Masamune swords made some six hundred years ago are superior to anything known today, both in original sharpness and durability.

Table I—Comparative Tests on Ancient and Modern Blades

Implement	Edge Angle	Original Sharpness	Durability
Hanckel Razor	15	117	8
Japanese Razor	15	110	6
Microtom	20	97	10
Stainless Kitchen Knife	27	56	9
Carbon Steel Kitchen Knife	25	55	12
Ancient Japanese Swords			
Hiromitsu	25	84	5
Masamune	33	66	15
Tadatsuna	32	58	8

Safety Razors Examined

Tests were made on a series of safety razor blades, made for experimental purposes, and having an edge angle of 14 deg. It was found that initial sharpness and durability increased up to 1.3 per cent carbon; beyond 1.5 per cent carbon the blades became too brittle. The best heat treatments and results are shown in Table II.

Studies on modern safety razor blades have also been recently published in England.[1] Several hundred examinations indicate that four types of edges are now marketed, the most common of which has a chisel cross section, with the metal near the cutting edge slightly rounded from both sides. Microscopic examination of such an edge will give very discordant results, unless a mounting fixture is used which places

[1] J. Ferdinand Kayser, *Journal* Sheffield Society of Engineers and Metallurgists, 1925, No. 2, p. 11; *The Engineer*, June 8, 1928.

as the Best of Modern Razors

the tangent plane at the very edge exactly perpendicular with the optical axis of the microscope.

Characteristics of Good Blades

Modern safety razors are usually made of 1.1 to 1.3 carbon steel strip, heat treated and sharpened. The microstructure of good blades shows globular cementite embedded in a structureless matrix; but the size and distribution of the excess cementite varies greatly. After sharpening and before etching, according to Mr. Kayser "a good blade should exhibit a perfectly straight edge under 400 magnifications, and have a Firth diamond hardness of 650 to 800." This generalization, however, is denied by other investigators. After etching, globules of cementite seem to project from the cutting edge. Desch and Roberts think that the size and uniformity of such projections are related to the ability of the razor to keep a cutting edge, but Kayser can find no such relationship.

The latter investigator believes that Prof. Honda's testing machine is unsuitable for razor blades, because a single cut through a pile of paper slips will ruin even the best razor for shaving. The only test now known to Kayser is actual shaving. He finds that shaving never causes a good razor edge to become wavy. If it is adequately protected from corrosion, wear eventually breaks down the edge in tiny patches, and in the last stage of usefulness, cementite particles may be found protruding from the cutting edge.

As a practical works test, microscopic examination at 30 diameters of the finished edge (unetched) placed in an adequate fixture will be sufficient, because if the edge has no perceptible nicks or undulations at that enlargement, it is as good as permitted by the limit of accuracy of the grinding machinery now in use.

The time-honored practice of drawing the honed blade across the finger-nail (in the cutlery shop a soft horn is substituted) is still used by the workmen in Sheffield cutlery houses to determine the fitness of razor blades for duty.

Putting an edge on the safety razor blade is done in the following manner:

1. Rough grinding on an emery wheel.
2. Fine grinding on an emery wheel or on steel rolls. (Alternative method: honing on a flat hone.)
3. Stropping.

Final stropping is apparently what produces the slight curvature on the ground surfaces just at the edge. A straight chisel edge is likely to feather, and is also liable to be too brittle for satisfactory use.

Frequently the published literature emphasizes the fact that razor blades should be wiped scrupulously dry and kept from moist atmosphere, for it appears that corrosion is the greatest enemy of a well-made blade. One author recommends careful drying with soft linen, then washing in absolute alcohol, then oiling in acid-free light machine oil.

CEREMONIAL Swords for the Forthcoming Coronation of the Japanese Emperor Made in Tokio by Kyusuke Mori in the Old Manner, Despite the Modern Iron Siding on His Shop. (Wide World Photo). The border decorations are photographs of ancient Japanese swords and scabbards in the Metropolitan Museum of Art, New York

Table II—Best Heat Treatment for Safety Razors

Steel	Quench	Draw	Original Sharpness	Durability
0.9 Carbon	740	150	102	12
1.3 Carbon	740	150	127	12
1.3 C,1.0 W	....800 (a)	200	108	26
1.3 C,1.0 Cr	....800 (a)	200	115	24
1.3 C,0.5 Mo	....800 (a)	200	114	24

(a) After first heating to 900 deg. C., then cooled slowly in furnace to quenching temperature.

BOOK REVIEWS

Electric Heating Discussed for Commercial Executives

Electric Heating. By Edgar A. Wilcox. Pages, 469, 6 x 9 in.; illustrations, 252; tables, 129. Published by the McGraw-Hill Book Co., New York. Price, $5.

Once in a while an author deserves a vote of thanks, and for the preparation of this second edition of a pretty good one appearing twelve years ago, this author should have one, suitably engrossed.

It undertakes to show that "the merits of electric heating are now being accorded deserved recognition." It might be said to be of more use to commercial executives and to salesmen than to purely technical readers; in other words, to market creators. Comparisons are made of the merits and limitations of fuel and electricity, and of the processes to which they may be applied with technical or commercial advantage or with relation to comfort and safety.

As most of the smaller and many of the larger appliances for electric heating depend on resistor elements, there is given a long list of factors of temperature, surface, exposure, etc., that should be considered.

The chapters on arc and resistance heating—arts that are bound to be of importance, not only in boiler making but also in shipbuilding and in steel bridge and house construction, to say nothing of repairing defective castings, is well prepared.

From metal furnaces for steel to incubators and brooders is a long jump, but the author does not neglect either. That electric heating is employed in painting, vitreous enameling and metal and chemical coating may be news to many, and they will find much of interest in this line.

Under the head of tempering of steel there are some statements that are not quite orthodox, in view of recent researches and experiments; for instance, that the rate of cooling is usually immaterial, whereas it has been shown by Weber, Frankel, Heyman and others that it is a very important factor, and that this time element depends very largely upon the temperatures employed for hardening and quenching or drawing; the same results being obtained by low hard tempering and long drawing temperature as with high temperature and short drawing period.

The chapters devoted to heating furnaces are unusually full and detailed; the limitations of fuel furnaces as regards large floor space, maintenance, labor cost, and difficulty of control with solid fuels, the necessity of auxiliary equipment, the frequent refractory repairs needed, the constant burner attention necessary for liquid fuel, and the explosive and poisonous nature, lack of availability in many industrial sections, diminishing supply and unreliability from year to year and also during cold weather, of natural gas, are pointed out.

As to the relative costs of fuel and electricity for furnace heating, the author states very properly that they are influenced by so many variables that no general comparisons can be made; the most carefully prepared preliminary estimates seldom check with the final results. He is, however, quite right in saying that such estimates are usually more correct and constant for electric than for fuel installations, provided all factors have been considered. The reasons for this statement are given on page 211.

The figures on the range of annealing temperatures for carbon steels, page 213, are hardly reliable enough for modern practice. The table of colors corresponding to temperatures should have been omitted, as no two workers have the same sense of color, and the conclusions of any one worker vary with the amount of light in the room, and from time to time according as his eye is or is not fatigued. Today we must rely upon the pyrometer to get accurate results.

There is an excellent alphabetical index. It will probably be some time before there is a better book on this subject. If there is, it will probably be by Mr. Wilcox.

ROBERT GRIMSHAW.

Working of Canadian Labor Disputes Act

Postponing Strikes: A Study of the Canadian Industrial Disputes Act. By Ben M. Selekman. Pages, 405, 5¼ x 7¾ in.; tables, 24. Published by the Russell Sage Foundation, New York. Price, $2.50.

This is a book in which a wealth of well chosen and timely material has been collected by experts and put together and commented on with good judgment. It is the result of observations "from the outside, looking in," and the compilers very candidly state that the conclusions reached on the subject are in some respects exactly the opposite from those arrived at in 1916. The change of base, however, was paralleled by that of the workers, who at first opposed the Canadian law concerning arbitration, and are now in favor thereof; the employers also experienced a change of heart.

The study considers the questions: Has the Disputes Act prevented strikes? What suggestions have been established by the boards for the technique of mediation and conciliation, investigation, and arbitration? What factors explain the change in labor's attitude? What has the Canadian Department of Labor worked out to prevent strikes and walkouts? What light does Canadian experience throw on the possibilities of governmental intervention in industrial disputes in our country?

The provisions of the Canadian act are laid down in considerable detail, and its operation from 1907 to 1925 tabulated and analyzed, showing that out of 640 applications in which only the machinery of the act was invoked, 431 boards sat and 536 cases were handled, over half of which were unanimous. In fact, in only 9 per cent was the strike not averted or ended. As with us, coal mining shows the largest proportion (40.7 per cent) of working days lost through strikes.

As regards administration of the act, officials in the Department of Labor constantly refused to prosecute for violations of the law; and the boards have discouraged publicity, some even excluding newspaper men from the hearings. There has been no code of industrial principles laid down or developed to govern decisions of the boards.

Complaints concerning the administration of the act have been due to: (1) Difficulty of employers and employees in agreeing as to the chairman, resulting in the Department of Labor's selecting him; usually, thought the employees, unfavorable to them. (2) The long time between establishing boards and submitting reports.

The last chapter is devoted to the significance of Canadian experience for the United States. The record "seems to point to conciliation as an excellent method of governmental intervention in industrial disputes." Its chief value lies "in the fact that it enables those intervening in industrial disputes to take a realistic view of the situation at hand."

There are two reasons for conciliation: It places upon the shoulders of employers and employees the responsibility for arriving at an amicable settlement, because whatever settlement is made must be translated into everyday prac-

tice by the employers and employees involved; and it puts the actual details of working out the settlement upon those most familiar with the technical aspect of the industry in which the dispute has arisen.

The report shows that on the Canadian railroads, where conditions are fairly stabilized, the machinery of the Disputes Act, where employed, has worked well. In the coal mines, however, it has failed. And in fine, it seems that compulsion as compared with conference and negotiation under governmental auspices is futile.

ROBERT GRIMSHAW.

1928—World's Greatest Foreign Trade Year

American Foreign Trade in 1928. Official Report of Fifteenth National Foreign Trade Convention at Houston, Tex., April 25-27, 1928. Pages 261, 6 x 9 in. Issued by the secretary, O. K. Davis, National Foreign Trade Convention headquarters, India House, New York.

Beginning with the organization meeting at Washington, D. C., in 1914, these foreign trade conventions have had a great output of high-grade literature on the development of the foreign trade of the United States. From the beginning, James A. Farrell, president United States Steel Corporation, has been chairman of the National Foreign Trade Council, and the steel and metal-working trades have been well represented at every gathering.

Secretary Davis, in issuing this 1928 volume, says that this is the world's greatest foreign trade year since pre-war time. The 48 principal trading nations of the world did $19,482,000,000 worth of export business last year, compared with $18,400,000,000 for 1925, which was the first year in which the world actually exceeded the pre-war volume of exports. The 1913 export total of 48 nations was about $17,700,000,000. Thus, the figures for last year, computed in 1913 dollar values, showed a gain of $1,782,000,000, or slightly above 10 per cent, in the course of world rehabilitation from the war.

The Houston convention, at which there were 1132 delegates, including more than 50 from 19 foreign countries, specialized on Latin-America. It was brought out that 10 nations south of Panama made a total gain in exports for the past two years of almost 20 per cent, giving South America world leadership in rate of increase in export trade. Combined purchases made by Latin-American countries in the United States exceeded $900,000,000 and were greater than their total purchases from England, France and Germany in 1927. The Proceedings take in papers and discussions of three general sessions and three export merchandising sections. At each of the latter three phases of the problem were handled by experienced men.

Blue Book on Scrap Industry

A revised Blue Book has been issued by the National Association of Waste Material Dealers, Inc., Times Building, New York. The new publication, the first since 1923, contains 324 pages and is bound in a flexible imitation leather. In addition to the constitution and by-laws of the association, a brief history and a description of the association's activities, there are separate sections devoted to iron and steel scrap, non-ferrous metals, scrap rubber, etc.

The metal section contains the standard classification of non-ferrous scrap, printed in parallel columns of English, French and German and the classifications of the American Railway Association. There is also a classification for nickel and monel metal suggested by the association. Lists are given of chemists, assayers, testing companies and sworn weighers and assayers in the United States and other countries. Among the non-ferrous metal subjects covered in this section are tariff provisions, composition of railroad bearings, United States Navy specifications on cast gun metal, imports and exports and a list of members dealing in non-ferrous metal scrap.

The iron and steel scrap section of the book, while not quite so complete as the non-ferrous section, gives the classification prepared by the association in conjunction with the National Association of Purchasing Agents and the Bureau of Standards. It contains tariff provisions, export and import matters, a suggested contract form for the purchase of iron or steel scrap and a list of members in this field.

There is considerable information on trade customs and specimens of suggested uniform contracts are shown. The Blue Book is much more complete with information than the first issue five years ago and provides a convenient form of reference for the buyer or seller of old material.

Quotations on Efficiency

A book, entitled "Personal and Business Efficiency," has been published under the authorship of C. A. Henderson by George H. Doran Co., New York. It has 308 pages and sells for $2.

It might be expected that a work on the higher mathematics—say a treatise by Einstein—would perhaps be tiresome and difficult reading; but here we have a book the subject and treatment of which should but will not interest every reader concerned.

Its object is "to present systematically and without frills, yet in a non-technical way, the best practical results of study in the fields vital to the welfare of the business man himself." Says the author: "Especially there is need of one which looks upon the business man as first of all a man who, among other things, is in business."

What the author has given us is hundreds on hundreds of quotations, showing a very wide range of reading. We have the sayings and opinions of all sorts and conditions of men, from Plato to Trotzky (né Bronstein), we have Prince Henry of Prussia and Emerson, President Eliot and Henry Ford, Percy McDougall and Mark Twain, the manufacturers of Providence, R. I., and Nina Simmonds, all cited; but the author's contribution seems to have been (besides the quotation points) similar to one often cited by Montaigne.

The questionnaires at the end of each chapter may make the book more useful as a textbook for hard workers.

New Books Received

The Labor Problem. By J. A. Estey. Pages 378, 6¼ x 9½ in. Published by McGraw-Hill Book Co., 370 Seventh Avenue, New York. Price, $3.

Economics of Consumption. By Warren C. Waite. Pages 263, 6¼ x 9½ in., illustrated. Published by McGraw-Hill Book Co., 370 Seventh Avenue, New York. Price, $3.

Influencing Men in Business. By Walter Dill Scott and Delton T. Howard. Pages 172, 6 x 9 in., illustrated. Published by Ronald Press Co., 15 East Twenty-sixth Street, New York. Price, $2.50.

Mineral Resources of the United States, 1925. Part I, metals, pages 768, 6 x 9¼ in. Part II, non-metals, pages 615. Published by the United States Government Printing Office, Washington. Price, $1 each.

Commerce Yearbook, 1928. Vol. I—United States. Pages 708, 6 x 9¼ in., illustrated. Published by the United States Government Printing Office, Washington. Price, $1.25.

Patent Office Practice. By Archie R. McCrady. Pages 387, 6½ x 9¼ in. Published by H. D. Williams Co., Ouray Building, Washington.

Mining Directory of Minnesota, 1928. By John J. Craig. Pages 229, 4¾ x 6¾ in., illustrated. Published by the University of Minnesota, Minneapolis, Minn. Price, $1.

Technisches Hilfsbuch der Osterreichisch-Alpinen Montangesellschaft. Pages 64, 5½ x 7½ in., illustrated. Published by Julius Springer, Schottengasse 4, Vienna, Austria. Price 3.60 m.

Industrial Lunch Rooms. Pages 65, 6 x 9 in., illustrated. Published by the National Industrial Conference Board, Inc., 247 Park Avenue, New York. Price, $1.

Pumping Unit Has Manganese Steel Parts

THE American Manganese Steel Co., Chicago Heights, Ill., has developed a series of portable pumping units to meet conditions of shock, wear and abrasion. There are three sizes now made, in which manganese steel has been used for shell, impeller and disks. All operate at 1200 r.p.m. The smallest size has 2-in. discharge and a 6-hp. power plant; the 2½-in. discharge machine has an 8-hp. power plant, while the 3-in. unit has a 10-hp. power plant.

Manganese Steel Parts Are Designed to Meet Shock, Wear and Abrasion in This Portable Pump

A long sleeve bearing with ring oiling, and babbitted, supports the shafting, to which the impeller is press-fitted. A large oil reservoir supplies lubrication for the drive shaft and the thrust bearing. The unit, mounted on a base plate, is connected by flexible coupling through a friction clutch to the source of power.

Electrically welded 3-in. channels form a frame, which is mounted on rubber-tired wheels, with spring shock absorbers fitted to the axle. The unit may be towed, while a leg near the towing ring supports the unit when it is stationary.

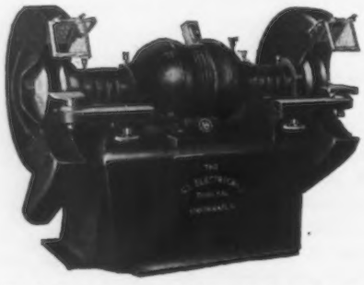
Power is applied from a Novo gas engine with satisfactory speed range. Regardless of size of unit, the chassis is uniform, having a length over-all of 9 ft. 6 in., an extreme width of 4 ft. 11 in. and a total height of 4 ft. The 24-in. wheels have a 4-ft. tread.

Capacity against a 34-ft. lift is given as 100 gal. a minute for the 2-in. unit. The 2½-in. unit is rated at 150 gal. a minute against a 34-ft. lift, while the 3-in. unit has 230 gal. capacity against a 37-ft. lift. These figures vary, of course, as the head and the length of the discharge line change.

Snagging Grinder Operates at 9500 Ft. Per Minute

A SNAGGING grinder with a speed of 9500 surface ft. per min., when equipped with 30-in. diameter wheels, having 2½ or 3-in. face, 18-in. hole and operating on 40 or 60-cycle circuits, has been placed on the market by the United States Electrical Tool Co., Cincinnati. When worn down to 24 in. in diameter, the wheel speed is 7500 ft. per min., the average speed of the 30-24-in. wheel being 8500 ft. per min. On 25 and 50-cycle circuits, 24-in. wheels with 2½ or 3-in. face and 12-in. hole, giving 9300 surface ft. per min., are recommended. The machine is furnished for 220, 440 and 550-volt, two or three-phase alternating current and 220-volt direct current.

The 15-hp. heavy-duty motor employed is rated for continuous service at full horsepower with a temperature rise of 40 deg. C. and with momentary overload capacity in excess of 100 per cent. The machine is built to safety standards of the American Engineering Standards Committee code. The wheel flanges are keyed to the shaft and securely clamped to the wheel by cap screws. The wheel hoods are of structural steel and are designed for wheel speeds of 10,000 surface ft. per min. The doors on the safety hoods are fastened by cap screws. The wheel shaft is of nickel steel, is in one piece, and is mounted on four heavy-duty ball bearings which are carried in dustproof housings.



High-Speed Operation, 9500 Ft. Per Min., with a 30-In. Wheel, Is a Feature. Wheel hoods are designed for speeds of 10,000 ft. per min.

Ladle Gearing for Smaller Ladles

WHILE geared ladles for pouring tons of molten metal have been in use for a long time, there has been a need for a special, quick-acting gearing for ladles of from 500 to 1000 lb. capacity. Such a construction has been developed by the Modern Pouring Device Co., Port Washington, Wis.

The hardship of tilting a forked shank is done away with entirely through this mechanism. The operator stands directly back of the ladle, protected from the heat by a sheet metal shield. A steadying lever attached to the bail frame facilitates quick "spotting" of the ladle. This makes pouring with a 500-lb. geared ladle a one-man proposition.

The worm gearing is self-locking and will hold the ladle in any desired position. After a mold is poured, it is necessary to tilt back the ladle only far enough to cut off the stream. It is not necessary to bring it back into an upright position each time. While this geared ladle was originally designed for operation on a pouring device, it is used also on an electric crane or hoist hook if desired, and can be operated by one man.

At Either Side of the Steel Shank, A, Are Guards to Protect the Trunnions, B, from Metal Splashes. The trunnions run in roller bearings. A cut steel worm in cast steel housing and cast iron worm wheel are completely inclosed. The steadying handle is shown at top

Locomotive Axle Journal Turning Lathe

A NEW 90-in. locomotive axle journal turning lathe with double quartering and crank-pin turning attachments has been brought out by the Niles Tool Works Division of the Niles-Bement-Pond Co., 111 Broadway, New York. This machine is equipped also for turning inside and outside of journals. The arrangement for journal turning and quartering has been previously described and illustrated.

For crank-pin turning the heads, of box tool type, are mounted on heavy bases bolted to the bed. The right-hand head is mounted on the base, to which the outside journal rest is attached. The left-hand head is mounted on an independent base, adjacent to the face plate. Both heads receive their rotation and their lateral adjustment from the quartering attachment spindles.

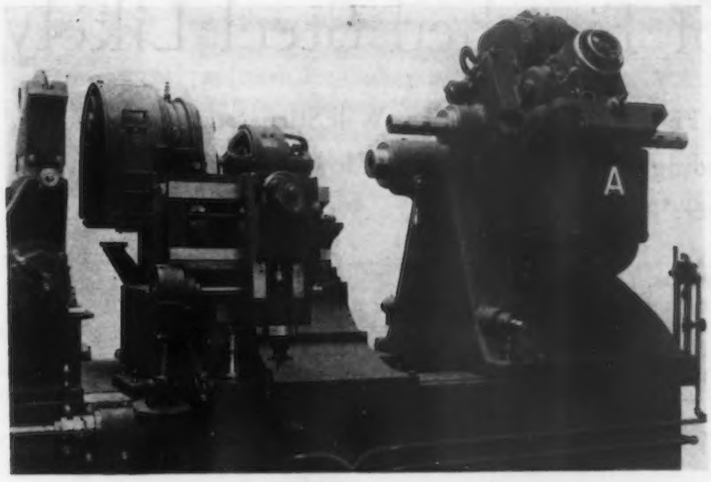
Capacity of these attachments for engine stroke is the same as for the quartering attachments—from 22 in. minimum to 40 in. maximum stroke. The crank-pin heads will turn pins from 7 to 12 in. in diameter and will accommodate pins of the maximum length.

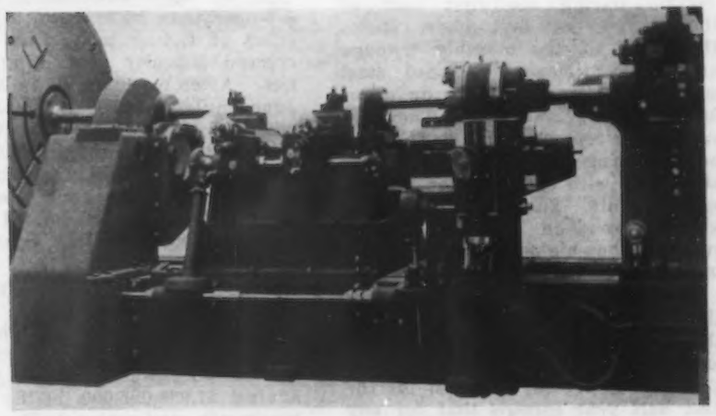
Burnishing tools with shanks to fit the tool slots in the crank-pin head tool holders are regularly furnished, to secure the desired finish after the turning operation. As illustrated, the machine is arranged to handle wheel sets with 90-deg. leads only. Increasing adoption of three-cylinder locomotives with cranks 120 deg. apart has made it necessary to provide for accommodating these wheel sets also.

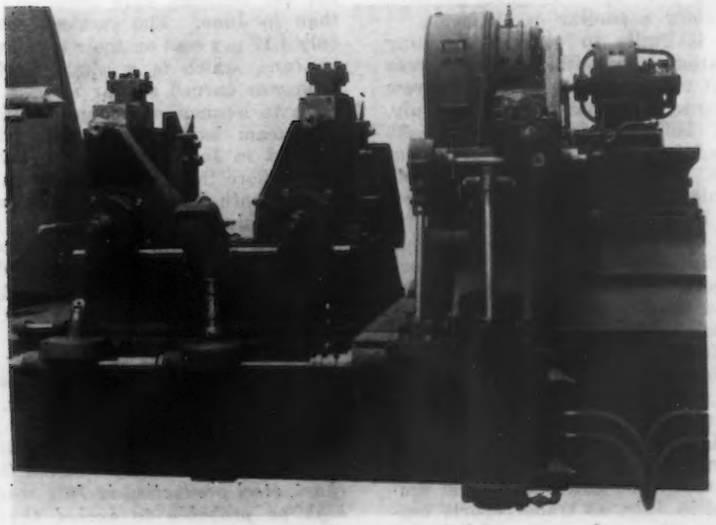
Where it is required to double quarter or turn the crank pins of such wheel sets, the right-hand attachment is raised and tilted 30 deg. by means of a filler block shown at *A* in detail view. This filler block may be readily removed to bring the quartering frame back to position for wheels with 90-deg. leads.

To support the boring bar for quartering and the crank-pin head for pin turning, additional brackets of corresponding height are supplied. These are secured to the members used for the same operations on wheels with 90-deg. leads.

Both journals on center crank axles for three-cylinder locomotives may be turned at one setting by use of the special rest shown in the second detail view. The rest has narrow slides and may be interchanged quickly with the regular rest. It has power longitudinal feed from the main feed shaft, but the cross-feed is by hand.







At Right Is a General View of the Lathe. Above is shown the fitting for handling three-crank axles, the filler block A tilting the head 30 deg. Below is the special rest for turning both journals, on three-cylinder locomotives, at one setting

Among improvements recently incorporated on this machine are steel wearing plates on the bed, beneath the sliding heads. These plates, which are renewable, are the means of preserving alinement between the two heads. This feature is particularly necessary in this type of tool, to insure parallel journals.

Average weekly earnings in June in representative New York State factories are reported by the States Industrial Commissioner at $29.48, compared with $29.19 in May. Except for March, this is the highest monthly figure so far this year, but it was exceeded by four months last year.

Business Analysis and Forecast

Record Sales of Finished Steel Likely

Bookings of First Half Indicate That Year Will Surpass 1923—Leading Consumption Lines, However, Not So Promising

BY DR. LEWIS H. HANEY
DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

DURING recent months the actual demand for finished steel, as reflected in sales for current requirements has been extraordinarily large and has amply warranted the high rate of production during the first half of the year. The first chart shows the trend of the monthly tonnage of various items of finished steel sold, which together make up about 50 per cent of the total. They are sufficiently representative to be taken as indicating the general trend of steel sales with the exception of rails and tin plate. Such sales showed an upward trend in June, when they reached the highest point in that month of which we have any record.

The average sales (in tons) for the second quarter were much above those for any recent year and show but a very small decline from the first quarter. Moreover, the total for the first half year exceeds that for any year on record, and forged ahead of 1923. Since the 1923 sales in the second half were small, it seems almost certain that 1928 sales will make a new record.

The performance in various lines of finished steel, however, has not been uniform. Fabricated structural steel sales, though large, fell more than usual in June, and there is some indication that they are rounding off as building operations let up a little. On the other hand, steel sheet sales made a good seasonal increase and were probably the highest on record for the month, due chiefly to heavy automobile production. The sales of steel plates and steel castings declined quite sharply, and the production of castings much exceeded orders. The business in plates has been affected by the low level of railway equipment buying as well as by unfavorable conditions in the oil industry and ship building. Thus, even the steel business shows signs of the prevalent spottiness.

Declining Building Activity Indicated

AS we have anticipated, building operations have begun to feel the effect of tighter money and the increased difficulty of floating securities. After rounding off in May and June, *building activity showed a declining trend in July.* There is usually some decline in that month, but this year it has been larger than normal. Construction contracts, measured in floor space, amounted to only 82,125,000 sq. ft. in July, against 93,981,000 sq. ft. in June, and our adjusted index falls to 129.5 per cent of the monthly average for 1921-26, against 130.6 per cent in June. The value of contemplated new construction in July was only $647,683,000, against $1,030,095,000, in the preceding month, and was actually smaller than a year ago. Building permits, too, show a similar development.

It is futile to compare building operations now with those of a year ago if the purpose is merely to draw an optimistic conclusion. In July, 1927, building was at a low ebb judged by the standards of recent years. As a matter of fact, contracts awarded last month were considerably lower than three years ago, in July, 1925; and, allowing for seasonal conditions, the July figure has been exceeded in ten months during the period since the middle of 1925.

Some evidence of the down-turn in building activity has already appeared in the bookings of structural steel. The decline in such bookings in June was a little more than usual, the figure being 303,800 tons, which compares with 311,300 tons in May. Apparently the downward trend continued in July, as trade reports concerning the orders for fabricated structural steel last month indicate a weekly average of about 34,000 tons, against an average of 42,000 tons per week in June. Several large new projects, however, are reported to be pending.

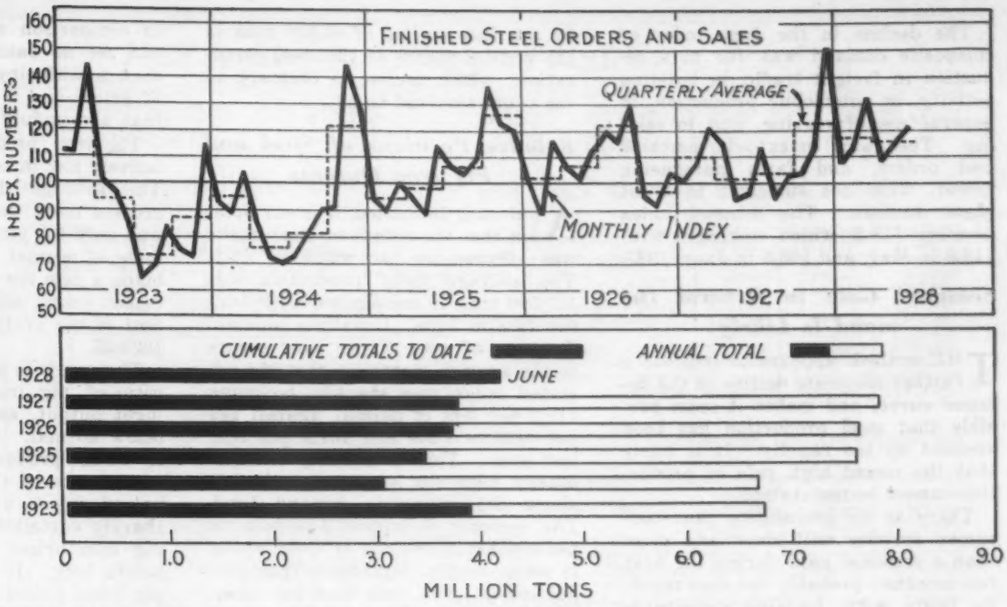
No Early Sustained Gains in Railroad Equipment

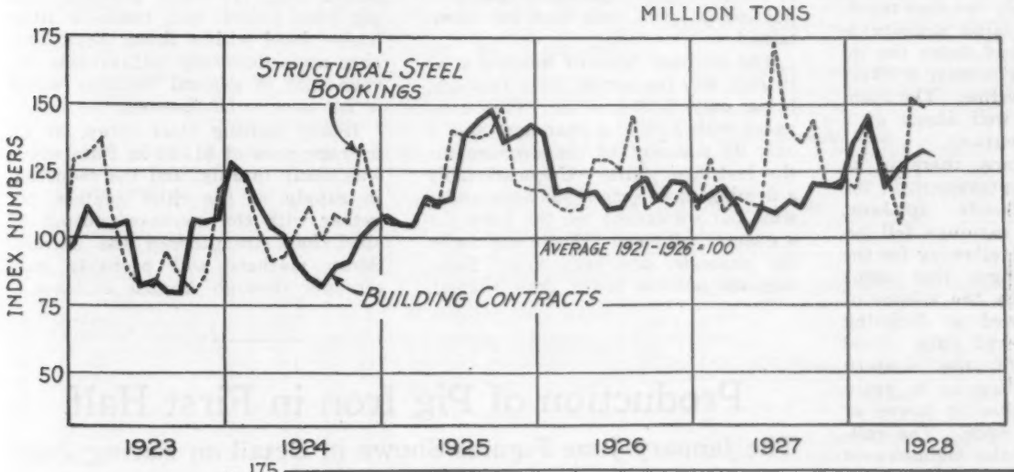
ORDERS for railroad equipment have shown no improvement, July having been a bad month in this line of business. The number of railroad cars ordered dropped to the smallest figure for the month that has appeared in many years, with domestic sales amounting to only 307 cars, in comparison with 1459 a year ago. Freqently there is a sharp seasonal decline in freight car buying during June and July, and some good sized inquiries have recently been reported, but conditions indicate no early sustained gains. The railroads have a rather large surplus of freight cars, and car loadings were fewer in July than in June. The carriers earned only 4.17 per cent on their investment in June, which is a smaller return than was earned a year ago.

As to locomotives, domestic orders for steam locomotives amounted to only 32 in July, and, though this is a few more than were ordered in the same month last year, it represents small business. That the total foreign and domestic orders for steam and electric locomotives declined is indicated by the fact that unfilled orders were reduced, in spite of a decline in shipments.

The total demand situation, as reflected in the combined activities of the chief consuming industries, is somewhat mixed; but resembles the trend of building, in that it is large but declining. As shown in the third chart, steel production in July rose so high as probably to exceed the indicated potential demand.

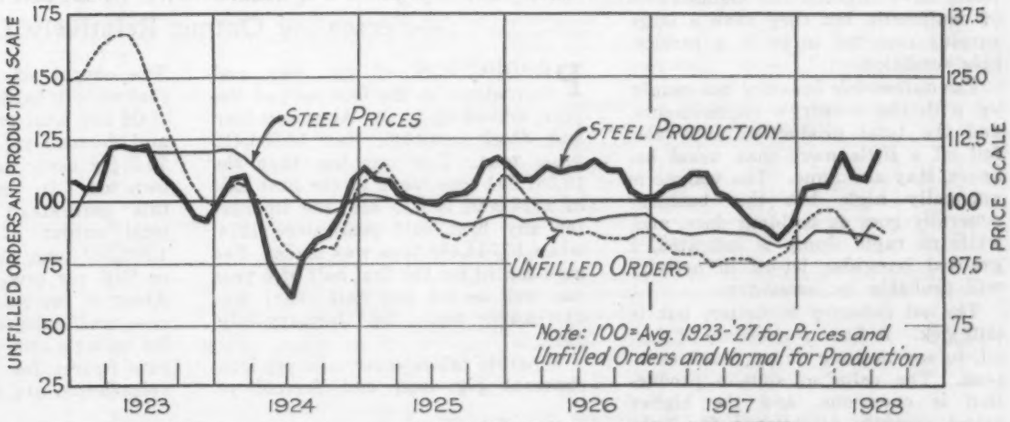
SALES of Finished Steel in the Second Quarter Were Much Above Those of Any Recent Year. The total for the first half forged ahead of 1923, and 1928 sales promise a new record

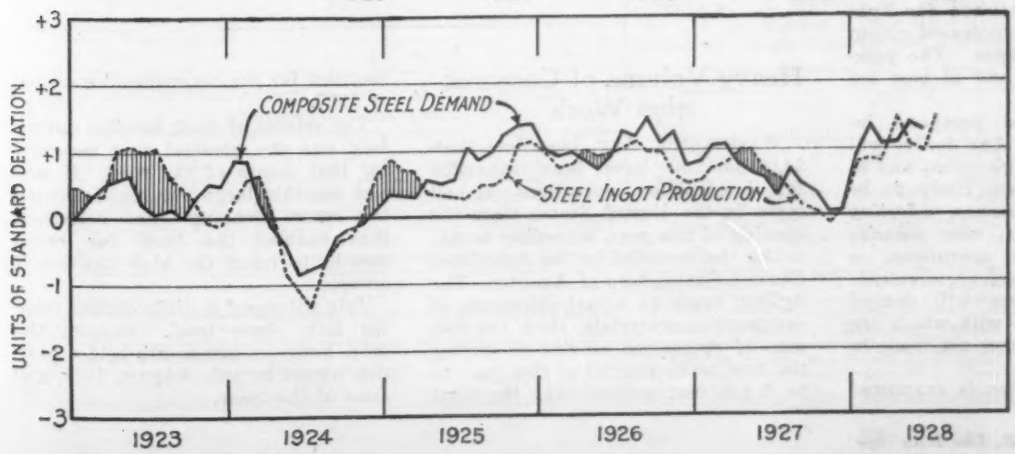




BUILDING Activity Showed a Declining Trend in July. Fabricated structural steel bookings fell off in June from May

STEEL Output Rose 19.2 Above Normal in July, Against 9 Per Cent Above Normal in June, Although a Decrease of Over 3 Per Cent Usually Occurs in the Seventh Month





STEEL Production in July Rose So High as Probably to Exceed the Indicated Potential Demand. And the outlook is for a moderate decline in the demand curve

The decline in the June index of composite demand was due to a reduction in freight traffic, in building activity, in automobile production, in general manufacturing, and in mining. The gains in exports, machine tool orders, and farm purchasing power, were not sufficient to offset these declines. The demand index becomes 118.2, which compares with 119.5 in May, and 108.5 in June, 1927.

Seasonal Gain in General Demand Is Likely

THE outlook appears to indicate a further moderate decline in the demand curve, and makes it seem possible that steel production has been speeded up too rapidly. It is likely that the recent high rate of production cannot be maintained.

There is no probability that consumer activity will show any more than a seasonal gain during the next few months—probably not that much. To begin with, *building activity* is headed downward, and under the influence of tightening money, is likely to continue on the decline. The country as a whole is well ahead of a normal building program.

In the second place, there is no indication of any improvement in the position of the *railroads*. In June, both net and gross earnings fell behind a year ago, and, allowing for the usual seasonal changes that occur from month to month, the volume of freight traffic showed a declining trend in both June and July. Good crops should benefit the western roads, but the question as to grain prices and the purchasing power of the farmers is still open. The railroads have slighted the maintenance of equipment, but they have a large surplus reported to be in a serviceable condition.

The *automobile industry* has caught up with the country's requirements, and the total production and sales fell off a little more than usual between May and June. The volume is unusually high, but this business generally goes as building does, and, while no rapid slump is indicated, a gradual irregular let-up in activity will probably be necessary.

The *oil industry* is better, but is still sick. It has an overdose of fuel oil, to say nothing of too much kerosene. The value of shut-in production is enormous, and the higher prices recently established for light crude may stimulate increased output and bring on a relapse. The prospects are uncertain and at best but fair.

Thus, the demand prospects indicate some decline. Any decline will start from a very high point, and at present does not seem likely to be severe. But *tight money, affecting the supply of funds, new security issues and building operations, is bound to restrict steel requirements for a time*—how long will depend upon the promptness with which the necessary readjustments are made in the credit situation.

This general position is supported by the July decline of 66,000 tons in the unfilled orders of the steel corporation; which decline is contrary to the usual seasonal trend.

Relative Positions of Steel and Pig Iron Outputs

AS already intimated, it is our opinion that the output of steel ingots was stepped up too much in July. The average daily production was 152,500 tons, in comparison with 144,000 tons in June. Usually a seasonal decrease of over 3 per cent occurs in the seventh month, so that the adjusted index rose sharply, becoming 119.2 per cent of normal, against 109 per cent in June and 101.3 per cent last year. This is not only extraordinary high for the season, but is above the composite demand level. *The increase in output has been at the expense of the size of order books.* It seems highly improbable that production at this rate can be maintained.

The average price of finished steel in July was the lowest since January, being only 2.321c. a lb. This compares with 2.367c. a year ago, and is only 92 per cent of the average for the last five years. Unquestionably a firming up in prices has been under way, but we cannot see the basis for a general advance. Sheets and nails, for example, are very low. Bars, too, are a little lower than normal, in comparison with billets. But we can see no basis for anything more than a stiffening in the general level of prices and a realignment of items that are unduly low.

Pig iron production continues relatively low in comparison with steel. The average daily production decreased more than usual in July and was only 6.1 per cent above our estimate of normal. At $17.07 the price made a new low monthly average for recent years, and was only 79.8 per cent of the average for the period of 1923-27.

The result is a sharp decline in the ratio of pig iron production to the ingot output, and this ratio is now below normal. Not enough pig iron is being produced, considering the recent rate of the steel output, and unless ingot production is rather sharply curtailed in the near future, pig iron prices are due to advance before long. It seems probable that pig iron prices will reach a little higher level within thirty days, barring some decidedly unfavorable development in general business which is not now to be foreseen.

Heavy melting steel scrap, at an average price of $14.13 in Pittsburgh, was cheap in July, and the reduction in supply at the chief centers, together with the increased output of steel, has strengthened the market. Scrap markets will probably rule stronger through August at least.

Production of Pig Iron in First Half

The January-June Figures Shown in Detail on Facing Page —Ferroalloy Output Relatively Large

PRODUCTION of pig iron and ferroalloys in the first half of the year, according to the American Iron and Steel Institute, was 18,686,412 gross tons. This was less than the 19,567,554 tons made in the first half of 1927 and it was also the smallest for any first half year since 1924, when 17,514,485 tons was made. The high record for the first half of a year (as well as for any half year) was 21,016,475 tons for January-July, 1923.

Separate tables cover coke pig iron, charcoal pig iron and ferroalloys. The output of ferroalloys exceeded that of both halves of 1927.

Of the total production of pig iron and ferroalloys, 14,497,636 tons, or 79.2 per cent, was made for maker's own use. In the first half of 1927, this percentage was 76.5. Of the total output of foundry pig iron, 1,902,382 tons, as shown in the table, or 90.6 per cent, was made for sale. About 58 per cent of the ferromanganese and spiegeleisen produced was for maker's own use. This year separate figures for ferromanganese and spiegeleisen are not given.

Heavy Volume of Construction Work

WASHINGTON, Aug. 14.—More than $4,000,000,000 have been expended for construction operations of all types in the United States since the opening of this year, according to statistics just compiled by the Associated General Contractors of America. The figures, based on actual shipments of construction materials, show the volume of operations carried on during the first seven months of this year to be 3 per cent greater than the total recorded for the corresponding period of 1927.

The volume of work handled during July was the greatest ever recorded for that month of the year. It was last month's large volume, following the record-breaking June activities, that enabled the total for seven months to reach the high position it occupies.

July witnessed a slight decline from the lofty June level. Despite the drop, however, last month held a position topped by only August, 1927, and June of this year.

1928 January-June Output of Pig Iron

HALF-YEARLY OUTPUT OF PIG IRON AND FERRO-ALLOYS BY STATES.

HALF-YEARLY PRODUCTION OF PIG IRON BY STATES.*

States.	Blast furnaces. (a)				Production of pig iron not including ferro-alloys—Gross tons.		
	In blast Dec. 31, 1927.	June 30, 1928.			First half of 1927.	Second half of 1927.	First half of 1928.
		In.	Out.	Total.			
Massachusetts	1	1	0	1			
New York	13	12	9	21	1,317,674	1,297,882	1,213,685
New Jersey	0	0	2	2			
Pennsylvania	48	52	49	101	6,374,364	5,092,093	5,762,007
Maryland	5	5	1	6			
Virginia	1	1	12	13	491,589	449,912	525,253
Alabama	18	16	19	35	1,461,562	1,296,825	1,252,229
Texas	0	0	1	1			
West Virginia	2	3	2	5			
Kentucky	1	2	3	5	389,361	422,393	413,611
Mississippi	0	0	1	1			
Tennessee	2	2	10	12			
Ohio	35	44	19	63	4,418,633	3,988,610	4,296,980
Illinois	16	15	10	25	1,840,038	1,748,425	2,042,079
Indiana	11	14	4	18			
Michigan	10	8	3	11	2,337,441	1,862,076	2,345,888
Wisconsin	1	0	5	5			
Minnesota	2	2	1	3	227,381	228,346	165,179
Missouri	0	0	2	2			
Colorado	3	3	2	5	344,027	269,600	295,430
Utah	0	1	0	1			
Total	169	181	155	336	19,202,070	16,656,162	18,312,341

(a) Completed and rebuilding pig iron furnaces.

HALF-YEARLY PRODUCTION OF COKE PIG IRON BY STATES.*

Massachusetts	1	1	0	1			
New York	13	12	9	21	1,317,674	1,297,882	1,213,685
New Jersey	0	0	2	2			
Pennsylvania	48	52	49	101	6,374,364	5,092,093	5,762,007
Maryland	5	5	1	6			
Virginia	1	1	12	13	491,589	449,912	525,253
Alabama	18	16	17	33	1,456,798	1,294,302	1,252,229
Texas	0	0	1	1			
West Virginia	2	3	2	5			
Kentucky	1	2	3	5	378,629	411,614	404,993
Tennessee	1	1	8	9			
Ohio	35	44	19	63	4,418,633	3,988,610	4,296,980
Illinois	16	15	10	25	1,840,038	1,748,425	2,042,079
Indiana	11	14	4	18			
Michigan	4	4	0	4	2,267,885	1,795,861	2,275,403
Wisconsin	1	0	5	5			
Minnesota	2	2	1	3	227,381	228,346	165,179
Missouri	0	0	2	2			
Colorado	3	3	2	5	344,027	269,600	295,430
Utah	0	1	0	1			
Total	162	176	147	323	19,117,018	16,576,645	18,233,238

HALF-YEARLY PRODUCTION OF CHARCOAL PIG IRON BY STATES.*

Alabama	0	0	2	2			
Tennessee	1	1	2	3	85,052	79,517	79,103
Mississippi	0	0	1	1			
Michigan	6	4	3	7			
Total	7	5	8	13	85,052	79,517	79,103

HALF-YEARLY PRODUCTION OF ALL KINDS OF FERRO-ALLOYS BY STATES.†

New York	1	1	1	2	64,776	95,019	93,192
New Jersey	0	0	0	0			
Pennsylvania	6	8	1	9	199,094	164,048	185,021
Virginia	0	1	0	1			
West Virginia	0	0	0	0	40,586	18,827	29,407
Tennessee	0	1	0	1			
Alabama	0	1	0	1			
Ohio	2	2	3	5			
Illinois	0	0	0	0			
Michigan	0	0	0	0	61,028	64,035	66,451
Iowa	0	0	0	0			
Colorado	0	0	0	0			
Total	9	‡14	5	|| 19	365,484	341,929	374,071

HALF-YEARLY PRODUCTION OF PIG IRON AND FERRO-ALLOYS ACCORDING TO FUEL USED.

Coke pig iron	162	176	147	323	19,117,018	16,576,645	18,233,238
Charcoal pig iron	7	5	8	13	85,052	79,517	79,103
Total pig iron	169	181	155	336	19,202,070	16,656,162	18,312,341
Total ferro-alloys	9	14	5	19	†365,484	†341,929	†374,071
Grand total	178	195	160	355	19,567,554	16,998,091	18,686,412

* Does not include the production of ferro-manganese, spiegeleisen, ferro-silicon, or other ferro-alloys.

† Includes ferro-manganese, spiegeleisen, ferro-silicon, and other ferro-alloys made in blast furnaces or in electric furnaces.

‡ During the first half of 1928 there were 16 blast furnaces in operation making ferro-alloys only or ferro-alloys and pig iron.

|| Blast furnaces only; electric furnaces not included.

HALF-YEARLY OUTPUT OF PIG IRON BY GRADES AND FERRO-ALLOYS BY KINDS.

HALF-YEARLY PRODUCTION OF BASIC PIG IRON.

States.	First half of 1927.	Second half of 1927.	First half of 1928.
Massachusetts, New York	424,856	498,610	518,625
Pennsylvania—Allegheny County	1,795,268	1,465,197	1,787,345
" Other counties	2,005,274	1,576,737	1,855,362
Maryland, W. Va., Ala., Kentucky	1,087,654	846,735	1,141,242
Ohio	2,166,811	1,912,209	2,170,385
Indiana, Illinois	2,552,221	2,136,209	2,781,455
Michigan, Minnesota, Colorado, Utah	464,329	424,954	461,574
Total.....Gross tons.	10,496,413	8,860,651	10,715,988

HALF-YEARLY PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON.

Pennsylvania	1,961,151	1,569,739	1,784,783
N. Y., Md., W. Va., Tenn., Ala	670,219	636,223	497,099
Ohio	1,570,035	1,263,075	1,395,124
Indiana, Illinois	792,317	643,156	780,748
Total.....Gross tons.	4,993,722	4,112,193	4,457,754
Including low-phosphorus pig iron	194,033	218,844	160,681

HALF-YEARLY PRODUCTION OF FOUNDRY PIG IRON.

Massachusetts, New York	600,756	510,331	435,834
Pennsylvania	486,879	419,117	247,567
Maryland, Virginia, Kentucky, Tenn	98,103	126,766	99,238
Alabama	630,087	677,409	585,902
Ohio	339,010	479,416	285,049
Illinois	234,234	234,206	220,730
Michigan	224,098	187,510	175,303
Wisconsin, Minnesota, Utah	130,039	126,458	65,775
Total.....Gross tons.	2,743,206	2,761,213	2,105,398

HALF-YEARLY PRODUCTION OF MALLEABLE PIG IRON.

New York	130,174	114,516	106,426
Pennsylvania	41,009	33,733	32,757
Ohio	335,789	317,182	438,420
Kentucky, Illinois, Michigan, Minn.	337,096	390,084	368,996
Total.....Gross tons.	844,068	855,515	946,599

HALF-YEARLY PRODUCTION OF FORGE PIG IRON.

New York, Pennsylvania	84,127	27,533	51,668
Virginia, Alabama, Ohio	11,318	21,554	9,257
Total.....Gross tons.	95,445	49,087	60,925

HALF-YEARLY PRODUCTION OF MISCELLANEOUS GRADES OF PIG IRON AND DIRECT CASTINGS.

New York, Pennsylvania	2,327	1,717	2,879
Alabama	6,265	2,745	2,295
Ohio	6,988	4,804	6,507
Ind., Ill., Mich., Wisconsin, Colorado	13,636	8,237	13,996
Total.....Gross tons.	29,216	17,503	25,677

HALF-YEARLY PRODUCTION OF FERRO-ALLOYS BY KINDS.

Ferro-manganese and spiegeleisen	222,460	171,886	205,073
Ferro-silicon	125,637	152,640	152,389
Ferro-phos. and all other ferro-alloys	17,387	17,403	16,609
Total.....Gross tons.	365,484	341,929	374,071

PIG IRON AND FERRO-ALLOYS MADE FOR SALE OR FOR USE OF MAKERS IN THE FIRST HALF OF 1928.

Pig iron and ferro-alloys.	For sale.	For maker's use.	Total. Gross tons.
Pig iron:			
Basic	810,714	9,905,274	10,715,988
Bessemer and low-phosphorus	227,164	4,230,590	4,457,754
Foundry	1,902,382	203,016	2,105,398
Malleable	844,586	102,013	946,599
Forge or mill	26,604	34,321	60,925
White and mottled, direct castings, etc.	3,255	22,422	25,677
Total pig iron.....Gross tons.	3,814,705	14,497,636	18,312,341
Ferro-alloys:			
Ferro-manganese and spiegeleisen	86,081	118,992	205,073
Ferro-silicon	152,389	.....	152,389
All other ferro-alloys	16,609	.....	16,609
Total ferro-alloys.....Gross tons.	255,079	118,992	374,071
Total pig iron and ferro-alloys G. T.	4,069,784	14,616,628	18,686,412

Mileage Rates Will Be Opposed

Reductions Proposed by Interstate Commerce Commission Examiners Not So Large as Pittsburgh Mills Hoped For—Hearings to Follow

STEEL companies, particularly those in the Pittsburgh, Youngstown and Wheeling districts, are expected to oppose vigorously the recommendations of the Interstate Commerce Commission's special examiners, Howard C. Faul and C. M. Bardwell, favoring the adoption of the mileage scale of freight rates on iron and steel products. Probably few, if any, of the shippers interested in the proceedings are satisfied with the outcome. Arguments for and against various features of the Faul-Bardwell plan will be made before the Interstate Commerce Commission. A Washington dispatch to THE IRON AGE published last week said that the commission probably would not hear arguments until fall, in which event it may be a year at least before the mileage scale, if approved by the commission, would go into effect.

That the adoption of the mileage scale would have the effect of further localizing the manufacture and distribution of steel products, a process that was started with the abolition of the "Pittsburgh plus" method of quoting prices is the opinion of many in the steel trade. Mills in the so-called Middle district (western Pennsylvania, West Virginia and Ohio) probably will not derive sufficient advantage from the small reductions in rates to Atlantic seaboard points, such as New York, Philadelphia and Baltimore, to offset the loss of tonnage which may result from the considerably higher rates to New England.

New England Rates Much Higher

New England, except for certain northern portions, has for some time had a blanket rate of 36.5c. per 100 lb. from Pittsburgh, 2.5c. above the Pittsburgh-New York rate. Under the mileage scale, however, blanket rates would be wiped out. Boston shipments would take a rate of 40c. and some more distant points in New England would take an even higher rate. New England manufacturing interests, which were represented at the hearings held by the Interstate Commerce Commission examiners, presumably will file objections to this scale on the ground of the injury it may do to New England industry.

It is admitted on all sides that the examiners had a most difficult task in sifting the maze of conflicting opinions and suggestions presented to them. The railroads admitted that steel should take a lower rate, but opposed changes which would reduce their revenues. The steel companies, particularly those in the Pittsburgh and nearby districts, wanted lower rates, but what was more important they did not want to disturb the relationship existing between rates from different producing points to important consuming points. In its brief filed Nov. 1, 1927, the United States Steel Corporation said:

"How the commission can arrive at a solution of their problem through the maze of conflicting suggestions is difficult to understand. To our mind no two of these suggestions can be reconciled."

Fifth Class Rates Held Unreasonable

Shippers were practically unanimous, however, in urging the unreasonableness of fifth class rates as applied to steel. They did not attack the fifth class rates as such, but took the position that steel by reason of its relatively favorable transportation characteristics and the great volume in which it moves is entitled to lower rates.

The carriers did not deny that the general level of rates on steel is relatively high if transportation characteristics alone are considered. They admitted that a substantial profit is derived from steel and that it is highly desirable traffic. Their contention, briefly, was that their profits as a whole do not afford them more than a reasonable return and that steel rates are not too high when consideration is given to the value of the service or what the traffic will bear.

The carriers also contended that the present rate level does not restrict the movement of steel and cited the fact that New England consumers buy much of their steel from Pittsburgh, though there are nearer mills with lower freight rates, and that Michigan consumers also buy much of their steel from distant mills notwithstanding the fact that closer sources of supply are available for them also.

Rates Influence Steel Marketing

All of the testimony given by steel shippers indicated that the level of rates is of much less importance than their relationship. Since the virtual abandonment of the "Pittsburgh plus" method of quoting prices in favor of delivered prices freight rates have assumed greater influence upon the marketing of steel; therefore the importance of having rates properly adjusted as between competing points of production was frequently emphasized.

Pittsburgh producers, for example, contended that the application of the fifth class rates from their mills to important markets in the East and of commodity rates lower than fifth class from the Eastern producing points to these markets is unduly prejudicial to them and unduly preferential to their Eastern competitors.

Producers in the Eastern district denied that the present rate adjustment to Eastern markets unduly prefers them or prejudices the Pittsburgh producers. They point out that the evidence in support of this claim consists almost entirely in showing that fifth class rates now apply from Pittsburgh, whereas commodity rates lower by varying percentages than fifth class apply from Eastern mills, with no proof that the respective fifth class rates are not properly related.

The Jones & Laughlin Steel Corporation contended that the decision in its case with respect to freight rates to Western points did not remove its cause for complaint and that existing rates, fixed under this so-called J. & L. scale, are still prejudicial to that company and preferential of competitors in Illinois and Indiana.

Producers in the Valley group contended that their rates are not properly related to those of their competitors, particularly competitors in the Pittsburgh district.

Say Rate Revision Is Needed

The examiners in their report say that "the record leaves no doubt as to the need and desirability of a thorough revision of the rate structure." They say, "There is disclosed an utter lack of consistency and orderly arrangement, accompanied by many instances of unlawful prejudice and preference which should be removed. . . . The evidence is persuasive that, with certain exceptions, rates on manufactured steel should be on a uniform level through the territory under consideration.

"It is the commission's duty," the examiners go on to say, "to fix reasonable rates on steel. While the record does not warrant as great reductions as would result from the application of the rates proposed by the shippers, it does indicate that many of the present rates are too high. A comparison

of steel with other commodities moving at fifth class rates or lower, the large and constant volume in which it moves, its heavy loading, the almost total absence of risk in connection with its transportation and its small value per weight unit, all are persuasive that fifth class rates are not a proper basis for this commodity."

In suggesting a uniform system of rates, the examiners say that "distance is the simplest and fairest measure of transportation service. If this system is adopted it will supplant a number of less extensive rate structures, some of them resulting from the interplay of competitive forces through a long period of years in which distance has played a minor part."

Moreover, the examiners point out that a uniform system of rates once established "should not be constantly threatened by the granting of concessions from the scale in favor of certain localities or certain traffic."

Port Differentials Disapproved

Although the examiners pattern the mileage scale they recommend on the J. & L. scale now effective in Western territory, they say that "it does not appear that this scale offers an entirely satisfactory solution of the problems presented." The examiners' objection to the use of the J. & L. scale is that, if universally applied, it would result in considerable increases in present rates because of its rate of progression.

In declaring against freight rate differentials, the examiners said: "The only purpose a differential can possibly have is to create an artificial rate situation calculated to give some community an advantage to which its geographical location does not entitle it."

No objection was made by the examiners to the retention of the present differentials on eastbound traffic as affecting Johnstown, Pa., and Cumberland, Md., but otherwise the examiners recommend that the use of differentials be disapproved. The port differentials by which New York, Philadelphia and Baltimore have had a fixed relationship were disapproved. If the recommendation of the examiners on this point is approved by the commission, the mileage rate from Pittsburgh to Baltimore would be 27c., to Philadelphia, 25c., and to New York, 33c. Under the present scale Philadelphia is 2c. and Baltimore 3c. under the New York rate. In export trade particularly, wherein rates 60 per cent of the domestic rates are applied, the advantage in favor of Philadelphia and Baltimore as against New York may be expected to bring protests from shipping interests in New York.

Decision on Grouping

One of the most difficult problems in the rate case, the examiners report, arose in connection with the subject of origin and destination groups. On this point the report says:

"Some of the present origin groups of steel producing points seem to be entirely reasonable. An example is the Valleys or Youngstown group. This group includes a number of steel producing points within an area not more than 50 miles in diameter which have been grouped for many years. The Buffalo group is another compact group containing only six steel producing points, no two of which are more than 20 miles apart. On the other hand, some of the existing groups are impossible of justification on any theory. The origin groups in the Eastern part of trunk line territory are undoubtedly much too large, particularly as they are used in connection with comparatively short hauls. The trunk line carriers concede that these groups cannot be defended."

In this connection the situation existing among eastern Pennsylvania mills is cited. Mills at Pencoyd, Coatesville, Phoenixville, Ivy Rock and Conshohocken pay 17.5c. per 100 lb. to New York, while Bethlehem, although the same distance to New York as Pencoyd (88 miles) pays 14.5c. Under the plan proposed by the examiners the Philadelphia group would be broken up and rates would be applied on a mileage basis, with Pencoyd and Conshohocken paying 14.5c., Ivy Rock, 15c., Phoenixville, 16c. and Coatesville, 17c. Bethlehem's rate would remain at 14.5c.

In considering the Pittsburgh group, the examiners see no reason for including such points as Erie, Pa., and Jamestown, N. Y., and recommend that Ohio and West Virginia points now included in the Pittsburgh group be given a separate grouping.

Would Restrict Destination Grouping

Destination groups, it was stated, do not seem to rest upon as logical grounds as do origin groups. Some of the shippers favored reasonable destination grouping if it can be accomplished without discrimination.

PRESENT AND PROPOSED RATES ON IRON AND STEEL IN CARLOAD LOTS
FROM PITTSBURGH, BUFFALO AND POINTS WEST TO MIDWESTERN CONSUMING POINTS
(Increases Are Shown in Boldface and Decreases in Italics)

TO	From Pittsburgh		From Youngstown		From Cleveland		From Chicago		From Buffalo	
	Pres.	Prop.	Pres.	Prop.	Pres.	Prop.	Pres.	Prop.	Pres.	Prop.
Akron, O	19	*17*	9½	**11**	9	9	30	*29*	26	*22*
Bay City, Mich	32½	*31*	30½	*28*	28	*24*	29½	*26*	29½	*28*
Bellfontaine, O	26	*23½*	24	*21*	22	*18½*	27½	*25*	30	*28*
Cairo, Ill	41½	*40*	41	*40*	38	38	26	**30**	47	**51**
Chicago	34	34	31	**32**	30	*28*	....	....	36	36
Cincinnati	27	27	26	26	26	*23½*	28	*26*	33	33
Cleveland	19	*18*	9½	**12½**	....	....	30	*28*	23	*20½*
Columbus, Ohio	25½	*21*	24	*20½*	21½	*18*	29	*27*	29	*27*
Dayton, O	26	*25*	24	*23½*	24	*20½*	27½	*25*	31	*30*
Detroit	29	*27*	26½	*23*	23½	*19½*	27½	*25*	26½	*23*
Evansville, Ind	37	*36*	36	36	34	34	23½	**26**	42	*39*
Flint, Mich	31	*29*	29	*26*	27	*22*	28½	*25*	28	*24*
Indianapolis	29	**30**	27	**29**	27	*26*	18	**20½**	34	34
Louisville	32	**33**	31	**33**	31	*30*	25	**26**	37	37
Milwaukee	37	37	35	35	33	*32*	9½	**14**	34	**38**
Muncie, Ind	27	**28**	24½	**26**	24½	*22½*	18	**20½**	31	**32**
Muskegon, Mich	35	*34*	33	*32*	31	*29*	26	*21*	33	*32*
Peoria, Ill	36	**37**	36	36	34	*33*	16½	**19**	39½	*39*
Quincy, Ill	43	*41*	39	**40**	36	**38**	20	**25**	44½	*43*
Springfield, Ill	38	38	37	*36*	34	34	18	**20½**	42½	*40*
St. Louis	40½	*39*	39½	*38*	36	**37**	22	**25**	44½	*41*
Toledo, O	26	*23½*	22½	*20*	20	*16½*	26½	*23*	28	*26*
Youngstown	11	**12**	....	....	9½	**12**	32	32	23	*20½*

(Rates Are Shown in Cents per 100 Lb.)

The retention of the present large destination grouping in New England in connection with comparatively short hauls was not advocated by either shippers or carriers. The strongest criticism of destination grouping in the hearings was directed against the establishment of the group rates from Chicago to Illinois destinations under the J. & L. scale.

The examiners recommend on this point that no origin grouping be authorized in connection with hauls of less than approximately 150 miles, except as otherwise provided, and that no destination grouping be authorized in connection with hauls of less than approximately 450 miles. The exception is that this would not prohibit the grouping of points located within a single switching district or in the industrial community immediately surrounding such district, nor would it prevent the grouping which would naturally result from the application of the distance scale.

Pittsburgh Objects to Fifth Class Rates—Approves Lower Rate to St. Louis

PITTSBURGH, Aug. 13.—Steel company traffic managers have had an opportunity to study the report of Examiners Howard C. Faul and C. M. Bardwell of the Interstate Commerce Commission and their recommendations for iron and steel freight rates for the northeastern part of the country. Although viewed strictly as a proposal that is likely to be revised before any new rates are ordered into effect, a feeling of disappointment that Pittsburgh did not get as much as it had asked is tempered by the fact that the proposed rates do take a definite step in the direction of modifying some of the inequalities, based upon the mileage principle, that had been the basis of complaint by Pittsburgh district producers.

The point is made that the rate from Pittsburgh to Chicago remains at 34c. per 100 lb. This is the fifth class rate between those points and, in its retention, it is seen that requests for a commodity rate went unheeded. On the other hand, the rate from Pittsburgh to St. Louis is to be lowered from 40½c. per 100 lb. to 39c. and that from Chicago to St. Louis is to be advanced from 22c. per 100 lb. to 25c., the differential in favor of Chicago over Pittsburgh being reduced to 14c. from 18½c. With Chicago mills quoting most products 10c. per 100 lb. higher than Pittsburgh, the proposed rate to St. Louis would make it necessary for Pittsburgh mills to absorb only 80c. a ton to equalize the delivered price of Chicago mills, compared with $1.70 under existing tariffs.

The accompanying compilations compare present rates with those proposed from the principal producing centers to typical consuming centers. The new rates to the several New England points are assumed ones, since it is expected that, as the new rates have been worked out on a mileage basis, there will be different rates to the different destinations, instead of a common rate to all points in New England as at present.

PRESENT AND PROPOSED RATES ON IRON AND STEEL IN CARLOAD LOTS FROM EASTERN PRODUCING POINTS TO EASTERN CONSUMING POINTS

(*Increases Are Shown in Boldface and Decreases in Italics*)

TO:	From Pittsburgh		From Buffalo		From Bethlehem		From Baltimore (Sparrows Point)		From Coatesville	
	Pres.	Prop.	Pres.	Prop.	Pres.	Prop.	Pres.	Prop.	Pres.	Prop.
Albany, N. Y.	34	34	21½	**26**	22½	*21*	22½	**28**	22½	**24**
Auburn, N. Y.	28½	**29**	14½	**17½**	22½	**23½**	22½	**29**	22½	**25**
Baltimore	31	*27*	32	32	19	**19½**	....	....	13½	**15½**
Berwick, Pa.	32	*25*	28	*25*	19	*16½*	19	**20½**	19	*18½*
Bethlehem, Pa.	32	*29*	32	*29*	....	....	19	**19½**	17½	*13½*
Binghamton, N. Y.	28½	*28*	19	**21**	22½	*19*	22½	**26**	22½	*22*
Buffalo	26½	*23*	....	....	32	*29*	32	32	32	*30*
Camden, N. J.	32	*30*	32	32	17½	*12*	16	**17**	12½	*10½*
Cumberland, Md.	15½	**18½**	25½	**28**	29½	*23½*	29	*20*	29½	*22*
Erie, Pa.	19	*18½*	13½	**14½**	31	31	30½	**32**	31	31
Harrisburg, Pa.	31	*23½*	32	*27*	17½	*15*	14½	**15**	12½	12½
Lancaster, Pa.	32	*26*	32	*29*	17½	*14*	14½	**15**	9	9
Newark	34	*32*	32	*31*	14½	*13½*	19	**20½**	17½	*16½*
New York	34	*33*	32	*31*	14½	**15**	19	**21½**	17½	17½
Norfolk, Va.	38	*36*	38	**39**	28½	*27*	21½	**24**	24	24
Philadelphia	32	*29*	32	32	13	*12*	14½	**17**	10	10
Reading, Pa.	32	*27*	32	*29*	13	*9½*	15½	**17½**	10	10
Richmond, Va.	38	*32*	38	*37*	28½	*27*	21½	*19½*	24	*23½*
Roanoke, Va.	38	*33*	38	**39**	34	*31*	34	*25*	34	*29*
Rochester, N. Y.	26½	*26*	11½	**12½**	22½	**26**	22½	**30**	22½	**28**
Scranton, Pa.	32	*27*	28	*24*	13	**15½**	19	**22½**	19	19
Syracuse, N. Y.	28½	**30**	17½	**18½**	22½	**23**	22½	**30**	22½	**26**
Trenton, N. J.	34	*30*	32	*31*	14½	*12*	19	*18*	15½	*11½*
Utica, N. Y.	31½	**32**	19	**21**	22½	**23½**	22½	**30**	22½	**27**
Washington	31	*26*	34	*33*	22½	*21*	11½	*10½*	18½	*17½*
Wilkes-Barre, Pa.	32	*27*	28	*25*	13	**14½**	19	**22**	19	*18*
Wilmington, Del.	32	*29*	32	32	17½	*14½*	14½	*13½*	8	**9**
York, Pa.	31	*25*	32	*28*	19	*15½*	14½	*12*	12½	*11½*
Boston	36½	**40**	33	**34**	25½	**27**	25½	**32**	25½	**29**
Hartford, Conn.	36½	**37**	33	*32*	25½	*22*	25½	**27**	25½	*23½*
New Haven, Conn.	36½	*36*	33	*32*	25½	*20*	25½	**26**	25½	*21½*
Providence, R. I.	36½	**39**	33	**35**	25½	**26**	25½	**31**	25½	*22*
Springfield, Mass.	36½	**38**	33	*31*	25½	*23*	25½	**29**	25½	*25*
Worcester, Mass.	36½	**39**	33	33	25½	*25*	25½	**31**	25½	**27**

(*Rates Are Shown in Cents per 100 Lb.*)

Corporate Profits Appear Stabilized

Total for All Corporations Close to $7,000,000,000 Annually for Three Years—Manufacturing Profits Less in 1927

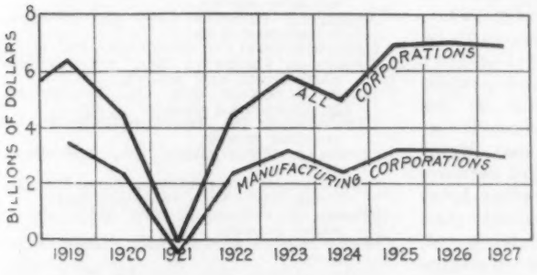
RECENT profits of corporations have been analyzed by the Harvard Economic Society from data furnished by the Commissioner of Internal Revenue, Washington. From a net deficit in 1921 there has been recovery until the last three calendar years have shown a practically uniform total approaching $7,000,000,000 each year. The figures, together with those for manufacturing corporations, as distinguished from all other, are shown in the table. In the Harvard study mining, transportation, public utility, trading and financial corporations were covered also, together with estimates for the farmers and for partnerships and sole proprietorships in business activities.

While the original diagram showed only the overall figures, the diagram herewith has added to it the figures for manufacturing corporations.

It is pointed out that recent profits are more substantial than would be indicated by merely their size. The value of the dollar has much increased with the fall of prices since 1921. Profits are not now tied up in high-priced inventories, as was the case immediately after the war. Taxation is lower from Federal sources and thus a larger portion of the operating profits becomes available for dividends.

Stability of profits of the past few years is indicated by the fact that no one of the last three shows a variation of much more than 1 per cent from the average of the three. This is in contrast with the preceding period, in which variations from year to year were from 30 to 40 per cent, even exempting the drop in 1921 of more than 100 per cent.

Two distinct cycles appear from the curves, one ending in the depreciation of 1921, while the other is still in its prosperity phase. The setback of 1924 appears moderate. As a matter of fact, profits that year were the third largest to that date since the war, being more than 10 per cent ahead of 1920, which through a large portion of its course was regarded as a boom year.



Manufacturers Did Not Hold Their Profits So Well in 1927 as Did Other Corporations. Even so, 1925 to 1927 Showed Slight Fluctuation

Profits of Corporations in Millions of Dollars

Year	All Corporations	All Manufacturing Corporations
1919	6,419	3,493
1920	4,468	2,337
1921	—55	—473
1922	4,380	2,331
1923	5,827	3,174
1924	4,998	2,417
1925	6,971	3,246
1926 (a) ...	7,050	3,240
1927 (a) ...	6,900	2,990

(a) Preliminary figures.

All the figures given are based upon the amounts reported by the corporations for income tax purposes. They would not tend to overstate the amount of corporate profits. They are net in a double sense: They represent profits after all expenses, including depreciation, depletion, interest, and Federal and other taxes; they represent profits of corporations in the aggregate, after allowing for deficits of all corporations losing money, though still going concerns. Intercorporate dividends are excluded.

Coke Production in June 5 Per Cent Below May

WASHINGTON, July 31.—Due to a decrease of 3 per cent in the daily output of pig iron there was a slight decline in the production of coke during June, which dropped to 4,263,268 net tons, as against 4,475,864 tons in May, according to the Bureau of Mines. Beehive coke daily production fell off 16.6 per cent to 11,615 tons from 13,926 tons, while the daily output of by-product coke declined 0.2 per cent to 132,042 tons, from 132,254 tons.

For the six months ended with June total production of coke was 25,941,536 tons, against 26,532,075 tons for the corresponding period of last year. Production of by-product coke showed an increase of 7 per cent in output, with a total of 23,671,536 tons during the first half of 1928, compared with 22,113,075 tons for the first six months of 1927. Beehive coke production, on the contrary, showed a decline of more than 48 per cent, decreasing to 2,270,000 tons from 4,419,000 tons.

Of the by-production during the first six months of 1928, ovens in Pennsylvania, the Buffalo district, Ohio and adjacent plants made 12,347,799 tons; 2,255,710 tons were made in Alabama and Tennessee ovens and 6,054,730 tons in ovens in Illinois, Indiana, Michigan and Missouri.

With production of by-product coke in 1927 aggregating 43,884,726 tons, valued at $232,043,803, figures just issued by the bureau show that 30,687,198 tons, valued at $145,123,216, was used by the producers in blast furnaces, etc., while 3,761,864 tons, valued at $20,448,285, was sold for furnace use and 1,938,653 tons, valued at $15,112,967, was sold for foundry use.

Dry Cleaning of Blast Furnace Gas

Cleaning of gas from blast furnace operations without the use of water was described and illustrated in an article by George B. Cramp, which appeared at page 1111 of THE IRON AGE, Oct. 25, 1923. This method has now been taken up by the Gas Cleaning Engineering Corporation, 320 Broadway, New York, in addition to wet cleaning and other processes. The company has been organized to design and supervise the construction of general gas cleaning equipment.

Briefly, the method adopted is to pass the gas through a filter of flue dust, in which the dirt from the gas is entrapped. It is claimed that this method gives much cleaner gas than is obtainable by the wet method so long in vogue. At the same time it avoids cooling the gas and thereby saves much of its heat for use in hot blast stoves or under boilers. The design of the apparatus is tied up largely with questions of gas velocity to give best results. The cleaning is said to be adequate to fit the gas for burning without any further attention.

Among the advantages claimed are elimination of the high cost of maintenance experienced in wet washed gas apparatus and of the equipment and cost of pumping water. The first cost of the apparatus is said to be not much greater than that of the combination dry and wet apparatus so largely used. It is claimed that the dry cleaner will pay for itself by savings within three to five years.

The Concrete Reinforcing Steel Institute will hold its fall meeting at Shawnee-on-Delaware, Pa., Oct. 1 to 3.

Steel Treaters Announce Technical Program

Technical papers for the annual meeting of the American Society for Steel Treating, to be held in Philadelphia, Oct. 8 to 12, are announced as follows:

"Austenite Decomposition and Length Changes in Steel," by E. C. Bain and Willis S. N. Waring.

"The Cutting Qualities of an Alloy Steel as Influenced by Its Heat Treatment," by O. W. Boston and M. N. Landis.

"Metallurgical Problems of Transmission Gearing," by E. F. Davis.

"Methods of Approximating Certain Physical Characteristics of Nitrided Steel Cases," by G. M. Eaton.

"The Equation of the Carbon Time Curve in Basic Open-Hearth Refining and Prediction of Carbon Drop," by A. L. Feild.

"Surface Cooling of Steels in Quenching," by H. J. French, G. S. Cook and T. E. Hamill.

"High-Carbon, High-Chromium Steels," by J. P. Gill.

"Some of the Characteristics of Pearlite in Eutectoid Rail Steels," by O. V. Greene.

"On Oxygen Dissolved in Steel and Its Influence on the Structure," by M. A. Grossman.

"The Solubility of Carbon in Normal and Abnormal Steels," by Dr. O. E. Harder and Willard S. Johnson.

"Cloudburst Process for Hardness Testing and Hardening," by Edward G. Herbert.

"Deoxidation of Steel with Silicon," by C. H. Herty, Jr., and G. R. Fitterer.

"The Surface Hardening of Special Steels with Ammonia Gas Under Pressure," by Raymond H. Hobrock.

"On the Nature of Martensite Crystals," by Kotaro Honda.

"The Influence of Nickel on Combined Carbon in Gray Iron," by J. R. Houston.

"A New Tool Material," by Dr. S. L. Hoyt.

"A New Method for Heat Treating High Speed Steel," by H. C. Knerr.

"A Study of the Constitution of High Manganese Steels," by V. N. Krivobok.

"An Investigation of the Physical Properties of Certain Chromium-Aluminum Steels," by F. B. Lounsberry and W. R. Breeler.

"Depth and Character of Case Induced by Mixtures of Ferroalloys with Carburizing Compounds," by E. G. Mahin and R. C. Spencer.

"A Melting Record of Three Acid Open-Hearth Heats," by C. E. Meissner and W. E. Griffith.

"Service Annealing of Sling and Crane Chains," by W. J. Merten.

"Stainless Iron and Its Application to the Manufacture and Transportation of Nitric Acid," by W. M. Mitchell.

"Progress Made in the Use of Electric Furnaces for Heat Treating," by A. N. Otis.

"Chromium-Copper Steels as Possible Non-Corrosive Ferrous Alloys," by B. D. Saklatwalla and Albert W. Demler.

"Graphitization in the Presence of Nickel," by H. A. Schwartz.

"Heat Treatment of High Speed Steel to 2400 Degrees Fahr., in Molten Lead," by W. C. Searle.

"Steel Failures in Aircraft," by F. T. Sisco.

"On the Equilibrium Diagram of the Iron-Molybdenum System," by Takeshi Takei and Takejiro Murakami.

"The Torsional Modulus of Carbon Steel, Phosphor Bronze, Brass and Monel Metal," by William P. Wood.

"Decarburization of High Carbon Steel in 'Reducing' Atmospheres," by J. J. Curran and J. H. G. Williams.

"Application of Normalized Steels to Crankshafts and Other Automotive Parts," by H. T. Chandler.

"The Effect of Furnace Atmospheres on Steels," by R. G. Guthrie.

"Nature of Dendrites," by H. G. Keshian.

"Chromium in Silicon-Manganese Steels for Engineering and Structural Application," by A. B. Kinzel.

No title suggested—by F. F. Lucas.

"Selection of Steels for Ford Industry," by J. L. McCloud.

"Chromium Iron and Nickel Chromium in Dealing with Corrosion and Heat Resistance," by T. H. Nelson.

"A New Development in Corrosion-Resisting Steel," by Frank R. Palmer.

"The Manufacture of Acid Open-Hearth Steel for the Production of Forging Ingots," by H. P. Rassbach.

"Importance of Technique in Polishing and Etching Difficult Materials," by Mr. Vilella.

The tentative program for the Institute of Metals was published in THE IRON AGE, July 26, page 254.

Hotel Benjamin Franklin will be the headquarters of the steel treaters and the Institute of Metals, while the Bellevue-Stratford will be the headquarters of the American Welding Society during National Metal Week. All morning technical sessions will be held at the respective hotel headquarters of each society, the afternoon sessions assembling at rooms in the Commercial Museum, where the National Metal Exposition is to be held.

The annual banquet of the steel treaters will be held at the Benjamin Franklin Hotel, Thursday evening, Oct. 11.

Institute of Metals to Meet in Liverpool

The autumn meeting of the Institute of Metals will be held in Liverpool, England, from Sept. 4 to 7. The seventh autumn lecture is to be delivered by F. G. Martin on "Non-Ferrous Metals in the Shipping Industry." The following technical program has been arranged:

Laboratory Experiments on High Temperature Resistance Alloys, by C. J. Smithells, S. V. Williams and J. E. Avery.

Corrosion at Discontinuities in Metallic Protective Coatings, by U. R. Evans.

Constitution of the Alloys of Aluminum with Copper, Silicon and Iron, by A. C. C. Gwyer, H. W. L. Phillips and L. Mann.

Copper-Magnesium Alloys. Part III, by W. R. D. Jones.

Note on Practical Pyrometry, by G. B. Brook and H. J. Simcox.

Eighth Report to the Corrosion Research Committee. The Corrosion of Condenser Tubes. "Impingement Attack": Its Cause and Some Methods of Prevention, by R. May.

Rockwell Hardness Test, by J. E. Malam.

Die-Casting Alloys of Low Melting Point, by T. F. Russell, W. E. Goodrich, W. Cross, and (in part) N. P. Allen.

Work-Softening of Eutectic Alloys, by F. Hargreaves.

Die-Casting of Copper-Rich Alloys, by R. Genders, R. C. Reader and V. T. S. Foster.

Alpha Phase Boundary of the Copper-Silicon System, by C. S. Smith.

Properties and Production of Aluminum Die-Castings, by S. L. Archbutt, J. D. Crogan and J. W. Jenkins.

Methods for Investigating Alloys of Reactive Metals, by W. Hume-Rothery.

Strength of a Cadmium-Zinc and of a Tin-Lead Alloy Solder, by C. H. M. Jenkins.

Note on the Treatment of Aluminum and Aluminum Alloys with Chlorine, by D. R. Tullis.

Manufacturers Donate to Byrd Expedition

Manufacturers and dealers have been generous in donating to the South Pole expedition headed by Commander Richard E. Byrd, which gets under way this month. Goods valued at approximately $500,000 have been given. Some of the manufacturers who have contributed supplies are:

Air Reduction Sales Co., New York, acetylene outfit.
American Screw Co., Providence, R. I., machine screws.
Armstrong Brothers Tool Co., Chicago, machinists' tools.
Bethlehem Steel Co., Bethlehem, Pa., steel.
Bridgeport Hardware Mfg. Co., Bridgeport, Conn., nail pullers.
Brown & Sharpe Mfg. Co., Providence, R. I., machine tools.
Carborundum Co., Niagara Falls, N. Y., grinding wheels.
Cleveland Twist Drill Co., Cleveland, drills.
Corbin Screw Corporation, New Britain, Conn., machine screws and nuts.
Thomas L. Dickenson, New York, emery wheel dresser.
Henry Disston & Sons, Inc., Philadelphia, files.
William Dixon, Inc., Newark, N. J., belt dressing.
Goodell-Pratt Co., Greenfield, Mass., bearing scrapers.
Greenfield Tap & Die Corporation, Greenfield, Mass., taps and dies.
Thomas Laughlin Co., Portland, Me., marine hardware.
David Maydole Hammer Co., Norwich, Conn., hammers.
Peck, Stow & Wilcox Co., Southington, Conn., tools.
Reed Mfg. Co., Erie, Pa., vises.
John A. Roebling's Sons Co., Trenton, N. J., wire.
South Bend Lathe Co., South Bend., Ind., large lathe.
L. S. Starrett Co., Athol, Mass., machinists' tools.
Union Twist Drill Co., Athol, Mass., milling cutters.
Walworth Co., Boston, wrenches.
J. H. Williams & Co., Buffalo, drop forged tools.

Smaller Accident Rate at Metallurgical Works

Accidents at non-ferrous metallurgical works in 1926 were at the smallest rate on record. The figure was 110.8 for each thousand 300-day workers, compared with 116.4 in the preceding year and with an average of 142.2 in the 13 years, 1913-1925 inclusive. Fatal accidents showed a slight increase in 1926 over 1925, but otherwise were at the smallest rate ever recorded. They were 0.73 for each thousand 300-day workers, compared with 0.66 in 1925 and with an average of 1.04 in the 13 years preceding 1926.

Reduction in the accident rate below the 13-year record was 23.1 per cent; in the fatal rate the reduction was 29.8 per cent. Comparing 1913-1918 inclusive with 1919-1926 inclusive, the accident rate dropped from 151.0 to 131.7, or 12.8 per cent. Meantime the fatal accident rate dropped from 1.21 to 0.88, or 27.6 per cent.

Seasonal Shrinkage in Coal Stocks

Stocks of bituminous coal in industrial hands on July 1 are reported by the National Association of Purchasing Agents at 39,855,000 net tons, compared with 40,890,000 tons on June 1. This continues the steady decline from the peak of 60,154,000 tons, on Oct. 1, 1927. Consumption in June is estimated at 32,521,000 tons, compared with 34,844,000 tons in May, and was the smallest for about a year. Production in June is placed at 41,264,000 tons, compared with 44,748,000 tons in May and, with the exception of April, the smallest in more than a year.

Supplies in various industries are estimated, at an average, for 37 days consumption. This includes 41 days for steel mills, 35 days for railroads, 67 days for electric utilities and gas plants, 19 days for by-product coke plants and 37 days for other industries.

Fewer Iron and Steel Workers

Employees in 194 establishments making iron and steel were 0.8 per cent fewer in June than in May, according to a report of the United States Bureau of Labor Statistics. The respective numbers were 263,452 and 261,302, representing identical establishments. Payrolls in those two months showed a drop of 3.7 per cent, indicating a pay envelope about 3 per cent lighter in June. The respective dollar values for one-week in each month were $8,413,329 and $8,104,362.

In 968 establishments devoted to foundry and machine shop products there was an increase of 0.5 per cent in number of wage earners and of 1.3 per cent in total payroll. Employees advanced from 237,474 to 238,643 and payrolls for one week from $7,172,944 to $7,268,951.

Machine tool plants to the number of 148 reported a gain of 1.7 per cent in number of employees and of 2.2 per cent in payroll total. Hardware establishments numbering 68 showed a gain of 0.7 per cent in employees and 2 per cent in payroll. Structural iron workers increased 2.8 per cent in number and 1.8 per cent in total payroll. Cast iron pipe foundries to the number of 39 showed an increase of 0.3 per cent in employees, but a decline of 7.5 per cent in amount of payroll.

Taken as a group, iron and steel and their products showed an increase of 0.1 per cent in number of employees and a decrease of 0.9 per cent in amount of payroll. Other metal products showed a decrease of 0.6 per cent in employees and 1.2 per cent in payroll.

Industrial Engineers to Meet in Rochester

"Profitable Prosperity, a Practical Program for Cutting Costs and Raising Profits," will be the general theme of the fifteenth national convention of the Society of Industrial Engineers, which will be held at Rochester, N. Y., Oct. 17, 18 and 19. The meeting will be held jointly with the industrial management council of the Rochester Chamber of Commerce and the sessions will be in the rooms of the chamber of commerce and at the Hotel Seneca. George C. Dent is executive secretary of the society, the headquarters of which are at 205 West Wacker Drive, Chicago.

Heavy Production of Petroleum Continues

Production of crude petroleum in the United States in June is reported by the Bureau of Mines at 75,681,000 bbl. of 42 gal., compared with 77,311,000 bbl. in May and with 67,697,000 bbl. in June last year. Totals for the six months are given as 431,889,000 bbl. in 1928 against 405,460,000 bbl. last year, representing an increase of about 6.5 per cent.

Although June showed a reduction from May in total, there was an increase of more than 1 per cent in daily average for the shorter month.

Imports in June were 6,553,000 bbl., compared with 6,766,000 bbl. in May, and exports were 1,879,000 bbl., compared with 1,493,000 bbl. in May. Figures for production are runs from stills.

Creosoted Wood Block Floors Increase in Demand

The use of treated wood block floors in the United States in 1927 increased 28 per cent over the previous year, according to figures prepared by the United States Forest Service in cooperation with the American Wood-Preservers' Association. A total of 13,853,817 sq. ft. of these blocks treated with creosote or creosote-coal-tar paving oil was laid in 1927. The reason given for the increasing demand for floors of this kind is the desire for permanence, resilience, and high wearing qualities, especially in factories, machine and printing shops, foundries, etc., where heavy trucking is required.

Increase in Graphite Output

Graphite (plumbago or black lead) produced in 1927, was valued at $2,931,584, or 14 per cent more than the 1925 value of $2,569,487, according to data collected in 1928 at the biennial census of manufacturers by the Bureau of Census from 13 establishments (11 in 1925) engaged primarily in extraction from the ore and refining of graphite.

Two of the establishments in 1927 were located in Illinois, two in Michigan, two in New Jersey and two in Pennsylvania. The other five were in Alabama, California, New York, Ohio and Texas.

Comparison of First Half Earnings of Leading Steel Companies Over Three Years

(In Thousands of Dollars)

	Total Stockholders' Value, Dec. 31, 1927	Net Profits First Half 1928	Per Cent Earnings to Stockholders' Value, 1928	Total Stockholders' Value, Dec. 31, 1926	Net Profits First Half 1927	Per Cent Earnings to Stockholders' Value, 1927	Total Stockholders' Value, Dec. 31, 1925	Net Profits First Half 1926	Per Cent Earnings to Stockholders' Value, 1926
American Rolling Mill Co.	$53,057	$3,326	6.5	$47,321	$2,417	5.1	(Net Profits Not Available)		
Bethlehem Steel Corp. ..	401,319	7,914	2.0	392,283	10,667	2.7	$343,143	$11,214	3.3
A. M. Byers Co. (Sept. 30)	16,380	819	5.0	10,662	770	7.3	9,740	707	7.3
Central Alloy Steel Corp.	62,379	2,240	3.6	62,749	1,837	2.9	(Net Profits Not Available)		
Crucible Steel Co. of Am.	105,267	**2,428	2.4	104,700	2,975	2.9	(Net Profits Not Available)		
Donner Steel Co., Inc....	15,429	391	2.5	15,868	230	1.5	15,492	445	2.9
Gulf States Steel Co.....	19,540	542	2.8	17,656	371	2.1	17,621	417	2.4
Inland Steel Co.	70,269	4,842	6.9	67,120	4,346	6.5	64,830	3,333	5.1
Jones & Laughlin Steel Corp.	169,077	7,145	4.2	163,638	7,235	4.4	155,125	7,502	4.8
Ludlum Steel Co.	3,541	266	7.5	3,707	134	3.6	3,727	180	5.2
Otis Steel Co.	22,174	†1,743	7.8	21,407	930	4.4	22,092	†1,414	6.4
Republic Iron & Steel Co.	89,904	1,541	1.7	89,836	2,033	2.3	88,562	2,443	2.8
Superior Steel Corp.....	4,724	*32	—	4,914	*84	—	4,792	223	4.6
U. S. Steel Corporation..	1,704,950	47,201	2.8	1,692,086	52,465	3.1	1,630,447	53,723	3.2
Wheeling Steel Corp.....	78,054	2,554	3.3	76,877	1,848	2.4	74,790	2,288	3.1
Youngstown Sheet & Tube Co.	126,439	4,155	3.3	131,879	4,318	3.3	122,623	7,987	6.5
Total	2,942,523	87,075	3.0	2,902,703	92,492	3.2	2,552,984	91,876	3.6
Total without U. S. Steel.	1,237,573	39,874	3.2	1,212,617	40,027	3.3	922,537	38,153	4.1

*Deficit.
**Estimated.
†Before bond interest.

European Export Trade Improving

British Business Small But Inquiry Is Good—Payment of Reparations in Material Causes Concern to French Mills

(*By Cable*)

LONDON, ENGLAND, Aug. 13.

IRON and steel demand is still under the influence of the holidays and business is small. Cleveland producers of pig iron are maintaining prices firmly, as output is restricted, but hematite makers are seeking to dispose of stocks.

Foreign ore is quiet. The Swedish miners' strike has ended, but the general situation in ore is unlikely to be affected for some months, as most consumers are fully covered to the end of the year.

Finished iron and steel is generally quiet, especially in demand for heavy ship material for export, but inquiry is improving. July export of pig iron was 30,957 tons, of which only 50 tons went to the United States. Exports of iron and steel were 333,079 tons.

Tin plate mills have resumed operation following the holidays, with good order books for October to end of the year, but some August-September tin plate is still obtainable at lower prices. Makers are confident that demand will be renewed as current inquiries promise some good business. Galvanized sheets are generally quiet except for steady sales of small lots which have imparted a steadier tone to prices. Black sheets continue quiet.

Continental iron and steel prices are strong with makers well booked with tonnage, but current business slack. Purchases of Continental material by British users have been negligible, as a result of the holidays.

Polish production from April to June was 55,000 tons of pig iron, 118,000 tons of steel ingots and 83,000 tons of rolled steel products.

Anglo-German Cartel Not Expected

Pig Iron Agreement Requires British Syndicate—British Coal Competition Stirs the Ruhr

BERLIN, GERMANY, Aug. 1.—Producers here continue to regard the increasing agitation of the British conservative party for a safeguarding duty on iron and steel as of little importance. It is pointed out that Germany, despite a tariff on iron and steel, is a considerable importer of pig iron, steel and rolled products and that recently British imports of pig iron and steel have declined, but there has been no corresponding increase in home production. The argument of the proponents of a British tariff that it would increase the annual domestic output by about 4,000,000 tons is considered by German producers as questionable.

Reports in London of impending negotiations between Germany and Great Britain toward an agreement on pig iron are denied. It is stated here that the most that can be expected is an informal discussion as the British have no pig iron association or syndicate qualified to enter a binding agreement with any competitor. The recent appeal of Premier Baldwin for an international understanding is regarded as a political move to offset temporarily the persistent demands of the tariff advocates in his own party. No new negotiations have taken place toward admitting Britain to the International Steel Cartel.

Prospects of an agreement between Great Britain and Germany on pig iron have not been improved by the threatened increase of competition in coal. The Ruhr Coal Syndicate has again been aroused by British competition in the so-called "competitive districts" of Germany. In May, the syndicate resolved to withdraw in part from these "competitive districts" and leave them to Britain and Poland, but in June the decision was reversed and the syndicate reentered these districts with considerably increased sales. However, the British Government has now decided to antedate its already

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.86 per £ as follows:

Durham coke, del'd	£0	17½s.				$4.25		
Bilbao Rubio ore*	1	2½				5.48		
Cleveland No. 1 fdy	3	8½	to	£3	9½s.	16.64	to	$16.89
Cleveland No. 3 fdy	3	6				16.04		
Cleveland No. 4 fdy	3	5				15.80		
Cleveland No. 4 forge	3	4½				15.68		
Cleveland basic (nom.)	3	5				15.80		
East Coast mixed	3	8				16.53		
East Coast hematite	3	8½				16.65		
Rails, 60 lb. and up	7	15	to	8	5	37.66	to	40.10
Billets	6	0	to	6	15	29.16	to	32.81
Ferromanganese	13	15				66.83		
Ferromanganese (export)	13	0	to	13	5	63.18	to	64.39
Sheet and tin plate bars, Welsh	6	0				29.16		
Tin plate, base box	0	18⅛	to	0	18¼	4.40	to	4.43
Black sheets, Japanese specifications	13	7½				65.00		
						C. per lb.		
Ship plates	7	12½	to	8	2½	1.63	to	1.74
Boiler plates	9	0	to	10	10	1.92	to	2.25
Tees	8	2½	to	8	12½	1.74	to	1.84
Channels	7	7½	to	7	17½	1.58	to	1.69
Beams	7	2½	to	7	12½	1.53	to	1.63
Round bars, ¾ to 3 in.	7	5	to	7	15	1.55	to	1.66
Steel hoops	9	0	to	10	0	1.92	to	2.14
Black sheets, 24 gage	9	15	to	10	0	2.09	to	2.14
Galv. sheets, 24 gage	13	7½	to	13	10	2.86	to	2.93
Cold rolled steel strip, 20 gage, nom.	16	0				3.42		

*Ex-ship, Tees, nominal.

Continental Prices All F.O.B. Channel Ports

(Per Metric Ton)

Foundry pig iron (a):								
Belgium	£3	3s.	to	£3	5s.	$15.32	to	$15.80
France	3	3	to	3	5	15.32	to	15.80
Luxemburg	3	3	to	3	5	15.32	to	15.80
Basic pig iron (nom.):								
Belgium	3	1	to	3	2	14.82	to	15.07
France	3	1	to	3	2	14.82	to	15.07
Luxemburg	3	1	to	3	2	14.82	to	15.07
Coke	0	18				4.37		
Billets:								
Belgium	4	17½				23.21	to	23.69
France	4	17½				23.21	to	23.69
Merchant bars:						C. per lb.		
Belgium	5	17				1.29		
France	5	17				1.29		
Luxemburg	5	17				1.29		
Joists (beams):								
Belgium	4	19				1.09		
France	4	19				1.09		
Luxemburg	4	19				1.09		
Angles:								
Belgium	5	15				1.27		
⅛-in. plate:								
Belgium (a)	6	12				1.45		
Germany (a)	6	12				1.45		
3/16-in. ship plate:								
Belgium	6	8						
Luxemburg	6	8				.41		
Sheets, heavy:								
Belgium	6	1				1.33		
Germany	6	1				1.33		

(a) Nominal.

announced plan for reducing railroad freight rates. This plan gives British export coal an advantage that is interpreted in Germany as an indirect bounty. It will also cause the syndicate considerable financial loss unless the Ruhr producers withdraw from the "competitive districts," where selling can only be at a loss.

Domestic steel business is slightly quieter, with only high grade steels for the automotive industry in heavy demand. Engineering plants and other manufacturers report a decline in new orders and delivery terms have become shorter.

Export trade has improved and the Stahlwerksverband has advanced its prices. Quotations in foreign markets on wire rods and wire products, however, are unchanged. Exports to the United Kingdom, Holland, South American markets and India are active. Foreign demand for semi-finished material and bars has increased. Price rebates of the steel syndicate for August have in some cases been increased, while on other products they have been reduced. The "world market" prices established by the syndicate for August are: Steel ingots, 81.50 m. ($19.40) per metric ton; blooms, 86.50 m. ($20.60) per ton; billets, 93 m. ($22.14) per ton; shapes, 95.50 m. ($22.74) per ton; steel bars, 113.50 m. ($27.02) per ton, and wire rods, 120 m. ($28.57) per ton.

A loose combination of works of the class known as "Arbeitsgemeinschaft" has been negotiated among the locomotive builders, including the Henschel works at Cassel, Borsig at Berlin, Tegeler Maschinenbau A. G. at Berlin and I. Maffei at Munich. The principal purpose of the new combination is given as an effort to further technical progress in locomotive building. Business in locomotives shows no evidence of improvement. In the past few years the Railroads Corporation has bought only about 100 locomotives a year and these had to be distributed to 20 different German builders. Recently the Maffei works at Munich booked an order for 22 locomotives from the Indian railroads.

Reparations Menace French Industry

German Payments in Kind Used in Extensive Projects Which Do Not Benefit French Makers

PARIS, FRANCE, Aug. 1.—German payment of reparations in materials is causing some uneasiness to the French metal trades. Thus far, credits placed under the head of reparations in kind have not been particularly large, but from 1928 on, as large a sum as 1,300,000,000 gold marks will be credited yearly to France by the Reparations Commission. As the cash payments by Germany will not exceed 300,000,000 gold marks annually, France will be forced to absorb about 1,000,000,000 gold marks of materials.

The primary object of the Dawes plan was to permit the purchase from Germany of such commodities as were needed for consumption in France, but not produced domestically in sufficient quantities, such as coal, nitrogen, fertilizers, dyes, sugar, lumber, produce, etc. So long as French production of these products is smaller than the consumption there is no objection to receiving them on reparations account. However, to absorb this vast annual credit under the Dawes plan, it has become necessary to lay down a large program of public works for the utilization of this material. This was the object of the act of March 24, 1928.

Under the program established by this act are the purchase of naval and other maritime craft, modernization of ports, purchase of railroad rolling stock and shop equipment, establishment of large coking projects in the east of France, supply of telephone cable between Paris and Bordeaux, supply of materials for the construction of low-rent dwellings and equipment for the French colonies.

To satisfy French producers that this influx of reparations material from Germany would not seriously injure their business, the Government promised that only 20 per cent of the projected work would be done with reparations in kind. But it is pointed out by French manufacturers that if wages, transportation costs, etc., are deducted from the total cost of these projects, the 20 per cent, particularly in the case of port improvements, represents almost exactly the value of materials to be used. In addition, it is argued that for many years after termination of such work, it will be necessary to obtain repair parts from Germany.

Domestic demand is continuing to increase and there is a noticeable lengthening of deliveries on most products and concessions, in evidence early in July, have been almost eliminated. No advance in prices is expected, however, unless higher wages to coal miners in the Nord and the Saar mines causes increases in production costs.

Some works are considering increase in their capacity for production of open-hearth steel. Among these are the Acieries de Chatillon-Commentry, which is installing large furnaces. The Société Anonyme des Hauts Fourneaux, Forges et Acieries de Pompey is preparing to make nickel and chrome-nickel steel.

Machine tool builders report considerable activity and it is noteworthy that Andre Citröen, automobile manufacturer, is installing equipment for the production of a six-cylinder car about September. The total cost of this change will be about 40,000,000 fr. The company will continue to make a four-cylinder car.

Belgian Market Activity Promises Well for Fall

BRUSSELS, BELGIUM, July 29.—Iron and steel prices have been quite firm during the past 10 days, with many orders placed which were withheld during the Antwerp dock strike. This recovery of the market at a usually dull season is regarded as promising well for conditions in the fall.

Considerable railroad business has been booked and a contract for 35,000 tons of rails for the National railroads is pending in addition to some desirable export tonnages of railroad material for India and South American markets. Pig iron prices are firm despite French and British competition. Export quotations on steel per gross ton, f.o.b. Antwerp, are: Blooms, £4 12s. 6d. to £4 13s. 6d. ($22.48 to $22.72); slabs, £4 17s. to £4 17s. 6d. ($23.57 to $23.69); steel bars, £5 15s. to £5 16s. per ton (1.27c. to 1.28c. per lb.); wire rods, £6 per ton (1.32c. per lb.). Most prices are firm with an upward tendency.

Production of pig iron in June was slightly smaller than in May, but steel ingot and rolled products output showed a slight advance. Pig iron production was 321,030 metric tons, compared with 328,810 tons in May; steel ingot output 319,650 tons, compared with 316,210 tons in May, and production of rolled products 291,750 tons, compared with 276,250 metric tons in May.

German Metal Goods by Ships to Siberia

HAMBURG, GERMANY, July 28.—Following its successful trading voyage to Siberia last year, "Derutra," a company owned by German and Russian capital, is sending a fleet of eight ships, accompanied by two Russian ice breakers, to Siberia, via Archangel. The ships carry cargoes of agricultural machinery, metal goods and hardware of all kinds. They will sail up the Yenisei River, where their products will be exchanged for Siberian products. In this way most of the requirements of central Siberia for metal goods and machinery can be supplied by German industry. Last year the fleet consisted of four vessels, which sailed about this time and returned toward the end of September.

New Alloy Steel Works Established in France

PARIS, FRANCE, July 30.—A new steel plant has been established by German interests at Labuissiere under the name of Societe Anonyme des Fonderies de Labuissiere. Its principal production will be alloy and stainless steel and high quality steel tubes, a large proportion of which have been imported in the past from Great Britain and Germany.

Foreign Steel Too High to Compete

Importers in United States Sell Only Small Lots—Report That European and American Mills Will Meet

NEW YORK, Aug. 14.—With Continental steel prices continuing to advance, importers in New York are in most cases unable to do business in more than small lots. Following a recent increase in prices plain steel bars of Thomas grade are quoted at 1.29c. per lb., base, f.o.b. Antwerp, or about 1.85c. per lb., duty paid, New York. Beams are quoted at 1.70c. to 1.73c. per lb., New York, and channels at 1.73c. to 1.75., delivered New York. On the present scale of prices, open-hearth reinforcing bars are quotable at about 2c. per lb., duty paid, New York, or 2.10c. to 2.15c. per lb., delivered to consumers' plant in the metropolitan area.

As a result, the saving to consumers here is of so little consequence as to make it almost impossible for importers to sell concrete bars at these prices. In fact, the cost of the imported product is in excess of the price quoted locally in many cases on bars rolled from old rails and with a local New Jersey producer of iron bars reported preparing to roll concrete bars from old rails, importers do not seem to expect much future reinforcing bar business.

Importers report a moderate volume of business in small tonnages of various products and in a few instances are able to offer steel delivered at slightly less than the present European quotation, having been in a position to buy distress tonnages that came onto the market during the recent Antwerp dock workers' strike. Importers show considerable interest in future development of the Steel Export Association recently formed here to include the leading interest and many of the large independent mills.

A cabled report was received about a week ago by an importer stating that it was reported in European steel circles that a meeting of European producers and the new Steel Export Association was scheduled for September and October in New York. This report is doubted here, but importers are interested, as they point out that at such a convention the question of limitation of European exports of steel to the United States might come under consideration.

Safety Contests Reduce Accidents

Springfield and Worcester Figures Show the Latter City Gained From Competition

EARLY returns from the lost-time accident contests which have been started within a year by the local safety councils of a group of important manufacturing cities are interesting because comparisons can now be made with results in the similar contest which has been carried on in Worcester, Mass., without intermission for more than ten years. Until recently Worcester was the only city conducting such a contest. There the interest of participating firms has never lagged, for they saw accident hazard constantly diminishing. But it could only be guessed what part of the decrease came from the stimulus of competition and what part was due to the normal improvement in safety measures which would have reduced the hazard regardless of any contest.

The cities of Springfield, Mass., and Worcester have a number of resemblances industrially. Both have widely diversified manufactures. In both most of the large and many of the small plants are participating in the contest. Probably the natural industrial hazard runs no higher in the one city than in the other. But Springfield has been conducting its contest only since the beginning of 1928.

In the first half of this year 61 Springfield plants employed an average of 22,698 persons, who worked 27,591,207 man hours. In the same six months 42 Worcester plants employed an average of 23,133 persons, who worked 29,176,000 man hours. The method of reckoning results was the same in the two contests, being that established by the National Safety Council, in which the three factors are the number of man hours, the number of accidents and the number of days lost from employment because of them. From these are obtained two measures of comparison: One the frequency rate which is the number of accidents per million man hours, the other the severity rate, which is the average number of days lost per thousand man hours.

In Springfield in the initial six months of its contest the frequency rate was 19.36. In Worcester it was 7.6. In Springfield the severity rate was 1.16. In Worcester it was 0.42. In other words, the number of accidents was two and one-half times as great in the one city and their average severity nearly three times as great. An allowance should be made in favor of Springfield, in that its plants include more very small establishments whose accident rate has been found to be considerably higher than the average of the larger plants, because managements are more neglectful in applying safety measures.

No criticism of Springfield's industrial managements is involved in the comparison between the two cities. Worcester's rate would doubtless be approximately that of Springfield were it not for the effects of years of competitive striving. The Springfield Safety Council has made an aggressive campaign. Plants are divided into four groups according to the number of employees. Each month the winner in each group is given the custody of a banner indicating leadership. Employers are becoming more and more interested, which means the application of authority to an insistence that every one in the plant organization — superintendent, foremen and the rank and file—turn his mind to safety.

German Yard Builds Ships of Copper Bearing Plates

HAMBURG, GERMANY, July 28.—Following numerous tests, which are reported to have had satisfactory results both to the shipping companies and the steel mills, copperoid steel plates, which contain 0.28 per cent copper, are to be used in the construction of two vessels at the Deschimag A. G. at Bremen. Tests made are understood to have shown that the higher cost of these copper bearing plates was offset by their extended wearing qualities through resistance to corrosion. Reduction of costs of painting and replacement of rusted plates are considered sufficient advantage and the same tensile strength as in ordinary ship plates was obtained. If the two vessels to be constructed prove satisfactory, it is planned to produce these plates on a larger scale for shipbuilding.

European Freight Rates to Canada Reduced

HAMBURG, GERMANY, July 28.—Apparently in an effort to increase the tonnage of steel moving from Europe to Canada, shipping lines operating to Canadian ports have reduced rates on iron and steel from the Continent. The rate on pipe and steel tubes is now 27c. per 100 lb., a reduction of 12 per cent, and a corresponding downward revision has been made on other steel products.

The Detroit River was spanned Aug. 8 by a steel cable which was raised from the river and attached to the two concrete towers which will support the $20,000,000 Ambassador Bridge. The main span of the bridge will be 1850 ft. in length.

The Columbia Steel Corporation has purchased from the Burke Iron Co. ore deposits near Iron Mountain, Utah, adding 15,000,000 tons to its holdings, which now aggregate 25,000,000 tons.

This Issue in Brief

Manufacture and distribution of steel products would be further localized by adoption of mileage rates on steel shipments, the trade believes. Producers and consumers, as well as railroads, will argue for and against the proposed scale at Commerce Commission's hearing.—Page 408.

* * *

Electric heat-treating furnaces in Dodge plant have hearth floors made of three alloy plates locked at one end, and an alloy steel wall 10 in. high. The floor is supported by fire brick standing between the heating elements. Heat is transmitted through the floor without much loss.—Page 389.

* * *

Wire-drawing dies of tungsten-cobalt last longer and cost less than diamond dies, according to German claims. Alloy dies are not so likely to crack in service; they produce a smoother wire, and drawing speed can be considerably increased, it is said.—Page 394.

* * *

For high production of pig iron, keep the fusion zone low. Continued use of cold air raises the fusion zone. If the hearth is too hot, the logical procedure is to cool it by getting a larger tonnage, not by decreasing the output.—Page 394.

* * *

Industrial research uncovers new markets for New England manufacturers and increases profits by revealing how waste can be utilized. In one case a by-product grew so popular that it has outstripped what was formerly a manufacturer's principal product. In other cases sidelines are materially increasing sales volume.—Page 397.

* * *

Tight money is restricting building activity, says Doctor Haney. Construction is headed downward and will likely continue to decline, economist believes.—Page 406.

Sharpness of cutlery can be measured by new device. Under a definite load, the blade is pressed against a pile of paper strips. "Sharpness" is measured by the number of strips cut, and "durability" by the number of cuts required to reduce sharpness by 50 per cent of original value.—Page 398.

* * *

Earnings of steel producers decline still further. Average earnings of 16 leading producers for first half of 1928, in relation to stockholders' value, was 3 per cent, the poorest showing for that period in the past three years.—Page 413.

* * *

Foreign steel imports at low ebb on Atlantic seaboard, owing to narrow margin between foreign and American steel prices. Difference leaves little or no profit for importer, after paying freight and handling charges.—Page 416.

* * *

Safety contest reduces accident rate. Worcester and Springfield, Mass., competed during first half of year. Springfield's frequency rate was 19.36, while Worcester's was only 7.6. The latter city's excellent showing is ascribed to the contest, which has been conducted for the past ten years.—Page 416.

* * *

Attempts to elevate prices by combinations are doomed to early failure. Excess producing capacity gives birth to the cartel, says editorial writer. Artificial manipulations at once invite outside competition.—Page 418.

* * *

Able industrial management is attracting more and more attention from investors. Security buyers are studying companies with increasing care, realizing that the well-managed concern is the one that may be expected to yield greater dividends.—Page 418.

Water for cooling not required in new blast furnace turbo-blower. The only cooling water needed is that for oil coolers. The turbine can not be started before oil pressure is available to the bearings. If oil pressure fails, the turbine automatically stops.—Page 397.

* * *

Pig iron prices will reach a little higher level within 30 days, says Doctor Haney, barring some unforeseen development in general business. Economist believes that not enough pig iron is being produced, considering the recent rate of steel output.—Page 406.

* * *

Object to reparation payments in shape of materials and equipment. French manufacturers declare their business will be injured by acceptance of naval craft, rolling stock, shop equipment, telephone cable, etc., as part payment of war bill, and that German manufacturers will obtain replacement and repair business.—Page 415.

* * *

Heat-treating furnaces charged quickly and with small loss of heat by use of unique charging mechanism. Furnace doors are raised and charger pushes out the heat-treated forgings and pushes in the tray of cold forgings. The bottom of the tray is withdrawn, depositing the forgings in correct position on the furnace hearth. The entire operation takes only 30 sec.—Page 391.

* * *

Aggregate annual corporate profits vary only slightly in past three years. Total has been close to seven billion dollars for three consecutive years. But in the case of manufacturing corporations alone profits for 1927 were about 8 per cent below those of previous two years.—Page 411.

A. I. FINDLEY
Editor

THE IRON AGE

W. W. MACON
Managing Editor

ESTABLISHED 1855

Stock Market Appraisals

STOCK brokers last month charged their customers 7 per cent interest on debit balances. During the month investment bonds sold at prices that afforded a yield of about 5 per cent; preferred stocks about the same; while the common stocks of some of our superior industrial companies sold for a yield of less than 5 per cent and this was after the drastic decline in May and June, from which there has been only partial recovery. This summary looks contrary to preconceived ideas, and to a greater or less extent it is so in fact. Theoretically the prices for securities ought to adjust themselves to the money rate.

Why, then, do they fail to do so? The answer is two-fold. In the first place there is a prevailing sentiment that the high money rate at present existing is only ephemeral. Bankers and corporations enjoying a surplus may take advantage of it, but the rank and file of investors have to exercise their wits to find good bonds or preferred stocks yielding any more than 5 per cent. In the common stocks investors have been willing to buy on a yield of less than 5 per cent in the expectation that growth in business will relatively soon, in one way or another, produce an actual yield of a good deal more.

Thus, American Telephone and Telegraph, a premier security, which pays a $9 dividend, with official intimations that the rate will not be raised, recently sold in excess of 200 and is now in the neighborhood of 175, making the return around 5 per cent. But the stockholders recently enjoyed valuable privileges, which are recurring and give them an actual return in excess of the nominal. So it is with other standard corporations.

This reflects two important things in the investing state of mind. The first is the confidence that is felt in our economic outlook, and the second is the belief that so long as our national economy is soundly conducted our natural increase in population together with our improvement in efficiency will swell the business, profits and dividends of our enterprises, providing that the enterprises are well managed.

The last qualification recognizes the importance of management in the present investor estimation. The concern that avoids labor difficulties, that engages in scientific research work, that develops new resources, etc., is the one that may be expected to yield increased dividends. The concern that shuns those policies is the one that is likely to cease paying anything at all. In regard to this industrial psychology investors are more and more discriminating.

An expert speculative public is ever trying to anticipate such developments and in its operations makes use of banking credit. The tightening of credits curtails the activities of such persons, without affecting the economic denouement at all. If the outlook for a certain security indicates an appreciation of 10 per cent in the course of a year, it will reach that on the buying of investors who use their own funds, instead of the advance being effected in a few days on the buying of sharp speculators using borrowed money; and that is substantially the whole difference in events as between now and six months ago. The market will be less active, for there will be less churning.

In short, our stock market has become to a degree an intelligent and discriminating affair. We shall not venture to say that it is more so than ever before. However, it is distinctly not a market wherein gamblers may safely buy anything whatsoever, on the advice that the market is rising as a whole. On the contrary, we have now a situation wherein good things may be expected gradually to improve in value while bad things are likely to shrink.

Cartels Not a Cure

EUROPEAN industrial thought runs to cartels and conventions, whereof many have been formed in recent years. The idea is not new, such arrangements having been in existence in times long past. American thought does not now run that way for the simple reason that our laws forbid. The formation of associations for export trade is as far as our producers may go. European producers are unable to understand the difference and cynically remark that our laws permit concert of action for interference with their markets while preventing us from entering into any international agreements with them. This is, of course, a misunderstanding.

The cartel or convention is usually an exhibition of producers' despair, and for the long run nothing to occasion worry in the minds of consumers. It results from the development of excessive capacity for production and violent competition to make use of maximum capacity, with the consequent trimming of prices. The inspiration of the cartel is therefore fear and its purpose is to prevent prices from going lower rather than to raise them.

It has been the general experience of the world that attempts to elevate prices for the benefit of producers are doomed to early failure. Thus, the Secrétan corner in copper, the later adventure of the Amalgamated Copper Co., the Brazilian coffee valorization, and most recently the British rubber restriction. Almost all artificial manipulations in that direction at once invite outside competition. The only safety is in the

possession of natural monopolies, or with conditions so concentrated that agreements may be arranged and be kept among a few persons. Of this last the production of diamonds is a good example. There are not many commodities in respect to which conditions can be worked out so fortunately for the producers.

A general survey of production reveals bounteous natural resources, at least as far ahead as we do our figuring, and an excessive capacity for their beneficiation. Consequently the consumer enjoys low prices. In the end more or less capital is extinguished, as is happening now in the textile industry of New England. Meanwhile capital efficiently employed receives but a low return. An IRON AGE compilation shows that 16 of the largest steel companies of the country, including the Steel Corporation, earned 3 per cent for their stockholders in the first half of 1928, against 3.2 per cent in the first half of 1927. Mr. Schwab has estimated only 5 per cent per annum for the American iron and steel industry as a whole. Enmeshed in the operation of economic laws, the octopuses and giants are rather feeble. In the contest between capital and non-capital the former tends to get the worst of it.

Whence the Steel-Making Scrap?

TOTAL production of pig iron and ferroalloys in the first half of this year was 18,686,412 tons. The official statistics, just issued, are given elsewhere in this issue. Total production of steel ingots and castings may be estimated, rather closely, at about 25,400,000 tons. This would make the pig iron about 73½ per cent of the steel. Prior to 1911 production of pig iron exceeded that of steel ingots and castings, but in the past 17 years steel has been running ahead more and more.

There has always been a large excess of production of steel ingots and castings over the pig iron so used. That was true even in the Bessemer days, when scrap was thrown in to temper the heat caused by silicon running high. As far back as May 22, 1902, reference was made in an IRON AGE editorial to the rule made by large steel companies that scrap was no longer to be used in the converter but was to be saved for the open-hearth. So much pig iron was used in making iron castings that there was an excess of total pig iron over steel ingots and castings. Iron castings grew but little while steel grew greatly, and that helps to account for the swing so often mentioned, of "steel" exceeding pig iron. The works scrap has been chiefly responsible.

In the early days of basic open-hearth steel making there were large supplies of works scrap, because there was both Bessemer and open-hearth scrap. As open-hearth increased and Bessemer decreased the proportion of works scrap to basic steel decreased. Then came a turn in the other direction, and it is the extent of that turn which it is interesting to study at the present time.

A close measure can be had by dividing production of basic open-hearth steel ingots and castings into production of basic pig iron. As pig iron stocks used to vary materially it is safer to take pairs of years. In 1912-13 pig iron figured at 57.4 per cent. In 1926-27 it had decreased to 53.2 per cent. For the first half of this year basic pig was 10,715,988 tons and basic open-hearth ingots and castings may be put at 21,400,000 tons, which would make 50 per cent. The proportion of scrap has continued to increase.

There is ground in the statistics for the view that progress in the production of sound ingots has been entirely eaten up by demand for better steel, so that there is as much cropping, as large a percentage of works scrap, as a few years ago. The extra supply of scrap comes from outside, perhaps more industrial scrap, certainly more old material. And this latter is likely to increase for some years, for in the days when this old material was new the production of steel was increasing rapidly. Perhaps in time steel will be made to last longer, whereupon there would be another twist in the curve, but for a number of years the supply of old material will continue to grow.

British and American Outputs

SUPERIORITY of machine equipment in American manufacturing industries and much greater power behind the efforts of the average worker are emphasized in a report of the National Industrial Conference Board which compares British and American production results. Eight selected major industries in the United States used an average of one and one-half times as much horse power per wage earner as do the same industries in Great Britain. Production per worker shows a still more impressive difference, that in the United States being two and one-half to three times as much.

In this difference between the two countries in power consumed, on the one hand, and in production on the other, lies the very significant element of greater efficiency in the application of power. One horse power in the modern American steel mill or machine tool is of course a far greater producer than one horse power applied in machinery of older type, manufacturing the same product.

The difference in the two ratios is most marked in the steel industry. To quote the Conference Board report:

> Steel works and rolling mills in Great Britain in 1924 employing 200,181 wage earners turned out $660,895,000 of product, the net output or value added by manufacture representing $195,125,000 of the total. In the United States, in 1925, $2,946,068,000 worth of product was turned out with the relatively small working force of only 370,726, the net output or value added by manufacture amounting to $1,134,107,000. In the British industry 9.15 horse power, in the American mills 12.85 horse power, was back of every worker. As a result, production in terms of value added by manufacture in the American steel industry was $3,059 per wage earner employed, as against only $975 per worker in the British mills, or more than three times as much.

In other words, with 33 1-3 per cent greater power back of the American worker more than three times the British output was secured, reckoning in dollars. These figures concerning the steel industry will astonish no one familiar with it. American mills have made extraordinary strides in productive efficiency, partly through better systems, but more particularly through better equipment. It may fairly be said that the main factor is the automatic character of so much of the

machinery, reducing to a minimum the number of men employed.

The Conference Board's survey shows similar ratios to exist in the automotive and electrical industries. There, too, it is undoubtedly a matter of investment in the most modern equipment, of never-ending improvements in American machine tools and their prompt utilization by our manufacturers in the constant effort to reduce costs by lowering the items of overhead and labor.

Tin Prices and Consumption

LAST June pig tin in New York dropped to 45.75 cents a pound, its lowest price in almost four years, or since September, 1924, and the market has since had only a slight recovery. As the average price in the last two calendar years was 65 cents, there is now a relatively low market, only a trifle above the average in the three years before the war. The 15-cent tin of 1898 is of course only of historical interest. Whither tin is trending in the next few years is a problem of great moment.

Marketwise tin is by far the most mysterious of the familiar metals. It is notable that those most fully posted frankly state that virtually they know almost nothing. It is impossible to measure closely the influence of price upon production but the influence upon consumption is a more open matter.

Consumption of tin in the United States is roughly about 35 per cent for making tin and terne plate, 25 per cent or less for making solder and up to about 15 per cent for bearing metal, of which the automobile industry is a very large consumer, this allocation leaving 25 per cent for miscellaneous. It is significant therefore that comparing the average of 1912-13 with the average of 1926-27, deliveries of tin in the United States as reported by the New York Metal Exchange increased only 61 per cent, while the production of tin plate increased 93 per cent and automobile production increased 835 per cent, or by about 3,600,000 cars and trucks per annum.

During this period the tin plate makers greatly reduced the amount of tin consumed per box of tin plate. At the same time they improved the quality, which is largely a matter of uniformity in distribution of the coating, accomplished by more accurate rolling of black plate and by improved tinning methods, while the "list edge," formerly involving a large loss, has been almost eliminated. Solder is conserved by methods of can making that take less of it, by there being more mechanical soldering, and by the tin proportion being decreased. Collapsible tubes are now made of lead except where health requirements intervene. With aluminum at 25 cents a pound, aluminum foil is displacing tin foil. The proportion of tin in babbitt metal has decreased.

These changes represent accomplishments and there is no reason for assuming that cheap tin would result in a reversion to older practices. There might, however, be expansion of tin consumption in new uses. So much has been done that little room seems to be left for further economies, and the industries using tin promise continued expansion. In the last 15 years United States consumption has increased considerably more than that of the rest of the world and thus there are chances of consumptive demands elsewhere having a large increase.

Propaganda of long ago that tin production could not be greatly increased is exploded, for it has increased and there has been much progress in the technique. The working of alluvial deposits has been extended to leaner gravels, for with the improved dredging equipment and the use of gravel pumps, facilitated by operations passing into strong hands with command of capital, a half pound of tin per cubic yard is workable against one and a half pounds formerly.

Both supplies and consumption of tin have increased this year. World supplies in the first half of the year were reported at 62,249 gross tons, or 4034 tons increase over the first half of last year. Deliveries are reported at 61,751 tons, or 2848 tons increase. The visible supply increased 498 tons, against a decrease of 688 tons in the first half of last year. In the Federated Malay States production has increased, and last year, stimulated by the high prices of 1926 and 1927, it was 52,176 tons or 13.5 per cent more than in 1926. This year it has been running 20 per cent higher than in 1927, but with the lower prices of recent months the higher cost workings may do less.

NEARLY half a billion dollars is added by the recent General Motors contract for group life, sickness and accident insurance to the $6,379,000,000 of policies of this class in force at the close of 1927 for the benefit of industrial workers in the United States. Group insurance is least in cost, because negotiated and paid for in single transactions covering hundreds or thousands of individuals. It calls for no medical examinations and is independent of ages, because the employee group represents a fair average of human health, condition and hazard, and, surprisingly, its average age does not change. If an old-age endowment is included, with coverage for accidents outside of working hours, the workers' "total situation," as the insurance man calls it, is thoroughly protected. Helping the workers to help themselves is well understood to be a useful practice in promoting the welfare of industrial corporations. Group insurance protects the worker's family against loss of his earning power in case of accident or death, and with old-age provision included may even be said to protect him against the consequences of living too long.

HAVING failed to organize the automobile industry as well as various other metal-working lines, the American Federation of Labor is now to undertake the unionization of airplane manufacturing plants. The officers of the Federation cannot be unaware of the fact that the airplane plants, especially those building engines, have attracted to their payrolls the most expert of mechanics. In fact, there has been complaint recently from automobile companies that some of their best men were leaving for the better paid work of airplane engine building. Militant unionism has found that the more highly skilled the employment the greater the resistance to organizing effort. In the metal trades the best paid workers have not been attracted by the leveling aims of the unions and the supply of high-grade craftsmen seldom has been equal to the demand. Hence the outlook for the unionization of airplane mechanics cannot be called promising.

CORRESPONDENCE

Copper Content of Iron Ore

To the Editor:—I am attempting to get some information about the copper content of American iron ores. A fairly close examination of THE IRON AGE for the last 10 years fails to reveal any information on this subject. A number of articles were printed on the iron resources, giving the ordinary analyses in iron, sulphur and phosphorus, but none of them contained a figure showing that the ore had been analyzed for copper.

In the special volume of the British Iron and Steel Institute, covering its American visit in 1890, several analyses of iron ores are given, but even in this volume the only analyses which quote copper are those of ore from the Cornwall banks in Pennsylvania. These ores have only a trace of phosphorus, but are high in both sulphur and copper. Three analyses for copper are listed at 0.75, 0.56 and 0.30.

So far as I can learn, most iron ores are free from copper. This is particularly true of the Birmingham district and the Lake Superior district. In Tennessee, there are a number of beds that are high in copper or other metals, but as they are worked for the copper content rather than for the iron, they can hardly be classed as iron ores.

The Bureau of Mines states that it has no record of the copper content of iron ores, although it is known that some ores, such as at Cornwall, Pa., and at Fierro, N. M., contain small quantities of copper.

If any of your readers have further data on the subject, a communication would be appreciated.

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What Water Transportation Is Beginning to Mean

Developments Which Emphasize the Increasing Competition Which Chicago Mills Face Through Steel and Iron Coming from Abroad, from Eastern Plants of the United States, from the Pittsburgh District, Etc.

THE two photographs here reproduced show ships which have traveled from Europe by way of the St. Lawrence River and the Great Lakes to the docks of the East Chicago Dock Terminal Co. The upper one is of the Novadoc, which was loaded in England with low-phosphorus pig iron, and is being unloaded at Chicago. The lower one shows the unloading from a ship of structural shapes and pig iron; to be noted in this connection is the length of the steel beams and the facilities for double car loading.

The pig iron came over at a low rate not regarded as likely again to be duplicated or to become a regular practice, for the reason that the iron cargo was used essentially as ballast and that not many boats are expected to make trips under similar conditions. The particular boat was built in Europe for service under Canadian direction on the Great Lakes.

What is portentous for Chicago and indicative of a further alinement of distribution territories for other sections of the country through wider use of water transportation are some of the negotiations under way. For example, the feasibility is under consideration of carrying cast iron pipe from New Jersey by ship to the Chicago district by exporting it by boat into Canada and then importing it from Canada through the St. Lawrence waterways, with delivery costs into Chicago for about one-half the all-rail freight rate from Birmingham to Chicago, which is $8.20 a ton.

Similarly a Pittsburgh steel mill is planning to send steel by rail to Cleveland, where it would be put on board ship for transport to Chicago. With a rail charge of $2.60 a ton, boat freight of $1 a ton, and handling charges of 40c. and 50c. at Cleveland and Chicago, respectively, and the 50c. switching charge at Chicago, the transportation cost would be $5, against $6.80, the all-rail Pittsburgh-Chicago rate.

The special attention being paid to water shipments stresses the issue that a given production district, in this case Chicago, appears less secure from outside competition that the distinctly rail freight charges have helped to make it.

Iron and Steel Markets

Steel Demand Holds High Summer Level

Oil Pipe Business Mounting—Price Advances Announced on Sheets and Shafting—Large Pig Iron Purchases at Cleveland and New York

MID-AUGUST finds business holding up to the surprising volume of the past several weeks, without, however, signs of increases in the immediate future. The one exception is that the steel requirements for pipe for the oil industry are mounting rapidly. Otherwise, strictly new buying is on the whole not of impressive proportions. Seasonal expansion for fall needs, as in rails and wire products, cannot be expected before September.

Active specifying against contract purchases, often accompanied by demand for quick delivery because of low stocks, has lifted operations in the general Pittsburgh area to nearer 85 per cent of capacity than 80 per cent, or somewhat above the late July rate. In the Chicago district, specifications compare closely in volume with those of the first week of August, but for the most part they call for the lighter tonnage commodities and ingot output there has not increased.

The price trend is toward higher levels. Cold finished steel bars and shafting, including screw stock, have been advanced $2 a ton, restoring the base of 2.20c., Pittsburgh or Chicago, and preparing for a higher base for fourth quarter sales, provided hot rolled bars hold the $2 increase recently announced for the same period. New higher prices also have been named for last quarter sheet sales, and billets and other semi-finished steel are believed to be headed for a rise.

The oil industry has brought a brisk demand for seamless pipe for the new Santa Fe, Cal., oil field, and several pipe lines again are under active negotiation. A 250-mile line has just been closed, and the 480-mile line of 24-in. pipe from the Panhandle to Omaha, under consideration for some months, is an early likelihood, and progress is being made on a 500-mile line to St. Louis. For oil tanks for the Texas & Pacific 3000 tons of plates and 300 tons of large rivets will be required.

Several thousand tons of rails have been bought in the week, representing extra requirements for early delivery. Included were 1000 tons for the Wheeling & Lake Erie, on top of 2500 tons purchased two weeks ago, 1700 tons for the Southern and 2000 tons for the St. Louis & Southwestern.

The Missouri-Kansas-Texas has closed for 500 cars. For miscellaneous needs, the Pennsylvania is inquiring for 25,000 tons of plates, shapes and bars and the Great Northern for 6000 tons.

The prices to be asked for sheets for the fourth quarter are 4c. for autobody, 2.75c. for black, 3.60c. for galvanized and 2c. for blue annealed up to 45 in. in width and 2.10c. for sheets 45 in. and wider, all Pittsburgh base, with the usual differentials for Gary and Birmingham. Except for the autobody sheets, which would have the usual spread over black sheets, the new levels represent an advance of $2 over what has been regarded as the regular market, but compared with the basis of the bulk of current shipments are actually $3 higher on black and $4 on the galvanized product.

The considerable volume of sheet buying meanwhile gives color to the belief that no little tonnage already covered will be carried into the last three months of the year.

Although fabricated structural steel bookings, totaling only 25,000 tons, amounted to about half the average of recent weeks, continued activity is indicated by new projects calling for more than 37,000 tons. Subway work in New York accounts for 29,000 tons of this total.

The heavy tonnage of structural steel placed with fabricating shops during July is reflected by the tonnage report for the month of the New York Structural Steel Board of Trade, which indicated bookings of 70,000 tons in the New York metropolitan territory, exclusive of bridges, subways, etc. This compares with 38,000 tons in the previous month and is the highest amount since July, 1927, when 73,000 tons was reported.

Nails show a sharp rise in demand. Mill output having dropped to a 60 per cent rate now gives promise of expanding, particularly with the fall trade in prospect. No price advances are talked of, stabilization having yet to be thoroughly realized, following the Steel Corporation's recent reduction to the mid-point of the wide spread that existed among prices.

Pig iron sales at Cleveland totaled 84,000 tons, one of the largest weekly totals of the year, following bookings of 100 000 tons in the previous fortnight. In New York 16.000 tons was sold in addition to 30,000 tons bought for various plants by a maker of heating equipment. Selling pressure from steel company furnaces is abating with the increased use of pig iron in open-hearth mixtures. Prices have a firmer tone in the Central West, but in the East attractive tonnages are still bringing out concessions. Much of the business done is for the fourth quarter, indicating that many foundries believe the market is scraping bottom and that there is no advantage in postponing buying.

Heavy melting scrap at Pittsburgh has advanced another 50c. a ton, making a recovery of $1.50 to $2 above the recent low point. Scarcity of scrap in the face of efforts of dealers to cover short sales indicates that the advance has not yet run its course.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	Aug. 14, 1928	Aug. 7, 1928	July 17, 1928	Aug. 16, 1927
No. 2 fdy., Philadelphia	$20.26	$20.26	$20.26	$20.76
No. 2, Valley furnace	16.50	16.50	16.75	17.50
No. 2, Southern, Cin'ti	19.19	19.19	19.19	20.94
No. 2, Birmingham	15.50	15.50	15.50	17.25
No. 2 foundry, Chicago*	17.50	17.50	17.50	19.50
Basic, del'd eastern Pa.	19.00	19.00	19.00	20.00
Basic, Valley furnace	16.00	16.00	16.00	17.25
Valley Bessemer, del'd P'gh	18.76	18.76	18.76	20.26
Malleable, Chicago*	17.50	17.50	17.50	19.50
Malleable, Valley	17.00	17.00	17.00	17.50
Gray forge, Pittsburgh	18.01	18.01	18.01	18.76
L. S. charcoal, Chicago	27.04	27.04	27.04	27.04
Ferromanganese, furnace	105.00	105.00	105.00	90.00
Rails, Billets, etc. Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	36.00
Bess. billets, Pittsburgh	32.00	32.00	32.00	33.00
O.-h. billets, Pittsburgh	32.00	32.00	32.00	33.00
O.-h. sheet bars, P'gh	32.00	32.00	32.00	34.00
Forging billets, P'gh	38.00	38.00	38.00	39.00
O.-h. billets, Phila.	37.30	37.30	37.30	38.30
Wire rods, Pittsburgh	42.00	42.00	42.00	43.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.90	1.90	1.85	1.80
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.12	2.12	2.12	2.12
Iron bars, Chicago	2.00	2.00	2.00	2.00
Steel bars, Pittsburgh	1.90	1.90	1.85	1.80
Steel bars, Chicago	2.00	2.00	2.00	2.00
Steel bars, New York	2.24	2.24	2.19	2.14
Tank plates, Pittsburgh	1.90	1.90	1.85	1.80
Tank plates, Chicago	2.00	2.00	2.00	2.00
Tank plates, New York	2.17½	2.17½	2.17½	2.09
Beams, Pittsburgh	1.90	1.90	1.85	1.80
Beams, Chicago	2.00	2.00	2.00	*1.90*
Beams, New York	2.14½	2.14½	2.14½	1.95
Steel hoops, Pittsburgh	2.20	2.20	2.20	2.30

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Sheets, Nails and Wire,	Aug. 14, 1928	Aug. 7, 1928	July 17, 1928	Aug. 16, 1927
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	2.65	2.65	2.65	3.00
Sheets, black, No. 24, Chicago dist. mill	2.75	2.75	2.75	3.10
Sheets, galv., No. 24, P'gh	3.40	3.40	3.50	3.85
Sheets, galv., No. 24, Chicago dist. mill	3.60	3.60	3.60	3.95
Sheets, blue, 9 & 10, P'gh	2.00	2.00	2.00	2.25
Sheets, blue, 9 & 10, Chicago dist. mill	2.10	2.10	2.10	2.35
Wire nails, Pittsburgh	2.55	2.55	2.55	2.55
Wire nails, Chicago dist. mill	2.60	2.60	2.60	2.60
Plain wire, Pittsburgh	2.40	2.40	2.40	2.40
Plain wire, Chicago dist. mill	2.45	2.45	2.45	2.45
Barbed wire, galv., Pittsburgh	3.20	3.20	3.20	3.25
Barbed wire, galv., Chicago dist. mill	3.25	3.25	3.25	3.30
Tin plate, 100 lb. box, P'gh	$5.25	$5.25	$5.25	$5.50
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh	$15.50	$15.00	$14.00	$15.50
Heavy melting steel, Phila.	13.00	13.00	13.00	14.00
Heavy melting steel, Ch'go	12.75	12.75	12.25	12.50
Carwheels, Chicago	12.75	12.75	12.75	14.50
Carwheels, Philadelphia	15.50	15.50	15.50	15.50
No. 1 cast, Pittsburgh	14.50	14.25	14.25	15.00
No. 1 cast, Philadelphia	15.50	15.50	15.50	16.00
No. 1 cast, Ch'go (net ton)	14.00	13.50	13.50	14.75
No. 1 RR. wrot., Phila.	13.50	13.50	13.50	15.50
No. 1 RR. wrot., Ch'go (net)	11.00	10.75	10.75	11.50
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$2.75	$2.75	$2.60	$3.00
Foundry coke, prompt	3.75	3.75	3.75	4.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	14.75	14.75	14.75	13.50
Electrolytic copper, refinery	14.50	14.50	14.50	13.00
Zinc, St. Louis	6.25	6.25	6.20	6.37½
Zinc, New York	6.60	6.60	6.55	6.72½
Lead, St. Louis	6.00	6.00	6.05	6.40
Lead, New York	6.20	6.20	6.20	6.75
Tin (Straits), New York	48.25	47.87½	47.25	64.37½
Antimony (Asiatic), N. Y.	10.00	10.00	9.50	12.00

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Ingot Production Now Ranges from 80 to 85 Per Cent—Heavy Steel Scrap Again Advances 50c. a Ton

PITTSBURGH, Aug. 14.—If steel production is as large in the second half of the month as it has been in the first, August is likely to follow July in setting a record output. Mid-August finds this and nearby districts producing ingots at from 80 to 85 per cent of capacity. The leading manufacturers are producing at that range, while a number of the smaller companies are running virtually at capacity. The general average, therefore, is probably nearer 85 than 80 per cent.

A brisk demand for seamless pipe to take care of the requirements of the newly opened Santa Fe, Cal., oil field is one of the contributory causes for the upswing in steel output.

It seems that, while the larger producers wanted to conserve this field for development when the oil market improved, sinking of successful wells by some smaller operators made it necessary for the former to drill to prevent seepage of oil from below their land holdings. Coupled with the recent large pipe line orders, the steel requirements for pipe are mounting rapidly.

Specifications for sheets, tin plate, strip, bars and shapes all appear to have increased recently and the demand, as indicated by specifications, is at least holding its own in cold-finished steel bars (screw stock). Rails, track supplies and wire products are slow, but that is a seasonal condition. Strictly new business is not of impressive proportions except in seamless pipe, and in a general way the experience of the Steel Corporation in decreasing order books is common to the industry at large. But fourth quarter buying has not yet begun to manifest itself.

Price tendencies still are toward higher levels. Announcement has been made by one company of advances of $2 to $3 a ton in the common finishes of sheets on fourth quarter business. An advance of $2 a ton on orders taken for shipment over the remainder of this quarter has been made in cold-finished steel bars and shafting. Strip makers have firmer price ideas as to the future, while in semi-finished steel there is no longer much doubt that an attempt will be made to establish a higher market on shipments in the final quarter of the year. Wire products are firmly held in most centers, and makers of plates, shapes and bars are earnest in their effort to establish prices at more profitable levels.

A scramble by dealers to cover short sales in the steel works grades has sent prices up another 50c. a ton, and the recovery from the recent low point now amounts to $1.50 to $2 on heavy melting steel. This advance is about as sharp as any that has taken place in the market in recent years and probably has not yet run its course, as offerings are still light and it is hard to get scrap past outside markets to Pittsburgh, even at current figures. With steel works operations on the increase, there is a danger that some consumers who have scrap on order may not get sufficient supplies to escape fresh purchases.

Pig Iron.—In point of business this market still presents a sharp contrast

with others. While there is a very steady movement on old orders and some furnaces are shipping as much iron as they are producing, the current demand is very light and in all grades runs entirely to single carloads. Prices are unchanged, but reflect a somewhat firmer attitude on the part of producers, some of whom already have named $17, Valley furnace, as a minimum on fourth quarter foundry iron, or 50c. per ton more than is being done on current business. The steel companies appear to be using a larger proportion of their iron production than recently, and selling pressure from that direction has abated. The advance in scrap, which has brought heavy melting steel, delivered Pittsburgh, to even terms with basic iron at Valley furnaces is also a factor in the firmer prices on pig iron.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$16.00
Bessemer	17.00
Gray forge	$16.25 to 16.50
No. 2 foundry	16.50 to 16.75
No. 3 foundry	16.25 to 16.50
Malleable	17.00
Low phos., copper free	26.50

Freight rate to Pittsburgh or Cleveland district, $1.76.

Ferroalloys.—Consumers are taking out ferromanganese, ferrosilicon and spiegeleisen very steadily on contracts, but new buying amounts to little. Prices are unchanged.

Semi-Finished Steel. — Continued high operation of sheet and tin mills is reflected in good specifications on contracts for sheet bars. Strip makers are taking out billets and slabs steadily. New business in these various forms is light. Current shipments generally carry a price of $32, Pittsburgh or Youngstown, but it is becoming clearer that producers intend to ask $1 a ton more on fourth quarter tonnages and one producer of billets already is naming $34, Pittsburgh, as the fourth quarter contract price. Wire rods are firm at $42, base Pittsburgh.

Bars, Plates and Shapes.—Specifications on existing contracts are rolling in freely in bars and shapes, but shipments on old orders are exceeding new business and backlogs are decreasing. On such new business as is developing—it is chiefly made up of small lots—1.90c. is as low as any makers in this district are doing. Plates are not in such good demand as bars or shapes, and good railroad car tonnages seem essential to provide the mills with an engagement sufficient to make them independent of strip mill competition on prices. Pipe line orders are furnishing some plate mill engagement, and there is also a fair amount of river barge business. It has been a light week in structural awards for local shops.

Rails and Track Supplies.—The Norfolk & Western Railway this week will place 6000 kegs of spikes. The market for that product is easy rather than firm at $2.80, base, per 100 lb., and there is somewhat less insistence upon the recently announced charge of $5 a ton for less-than-carload lots. Shipments on old orders are fairly large and are exceeding new business. New rail business does not amount to much in either light or standard sections.

Wire Products.—Activity is lacking in nails and wire products, but there is marked firmness in prices. Dullness, common to this time of the year, is heightened by the large takings of jobbers earlier in the year to escape price advances.

Tubular Goods.—Continued good demand for seamless oil well pipe is noted, particularly from California, where deep drilling has uncovered fresh supplies. The Seminole field also is taking a goodly amount of seamless pipe. Lapwelded oil country goods are only moderately active, but lapwelded pipe capacity is well engaged on line pipe and the prospect is bright for additional business. The Texas Co. and several other producers are jointly interested in a pipe line calling for 218 miles of 16-in. pipe to run from Winkler County, Tex., and Lee County, N. M., to El Paso, Tex. The automotive industry still is a good taker of mechanical tubing.

Sheets.—The Youngstown Sheet & Tube Co. has announced fourth quarter prices, naming 4c. base, on automobile body sheets, 2.75c., base, on black, 3.60c., base, on galvanized and 2c., base, for blue annealed sheets of widths of less than 45 in. and 2.10c., base, for widths 45 in. and over, these prices all being f.o.b. Pittsburgh. The new prices, which probably will be followed by other producers, represent no change in body sheets, nor on what has been commonly regarded as the market on blue annealed sheets; on black sheets they are $2 to $3 a ton above the recent market and on galvanized from $2 to $4 a ton higher. This company also announces the adoption, effective Oct. 1, of a cash discount of one-half of 1 per cent on the f.o.b. mill value for payment within 10 days from date of invoice. Several important producers have announced this change in terms, but as yet the American Sheet & Tin Plate Co. has not followed. It is understood that some opposition to it has developed among jobbers. Sheet specifications still are heavy, notably from the motor car builders, and a feature is the promptness with which shipments are wanted in a number of cases. New business is not keeping pace with shipments on old orders, but backlogs are not decreasing enough to warrant any lessening of mill operations, which still are averaging 85 per cent of capacity.

Tin Plate.—More favorable weather conditions have resulted in increased production. Demand for tin plate for perishable food containers continues heavy. The Northwestern salmon pack is exceeding expectations and has produced some supplementary orders to accommodate it. Mill operations still are more than 90 per cent of capacity, with output more in keeping with that rate on account of restored mill crew efficiency due to cooler weather. Changes in the furnaces at the Gary mills of the American Sheet & Tin Plate Co., to accommodate the new system of breaking down the bars on continuous mills, will mean that four mills (two double mills) will be idle at a time while the furnaces serving them are being altered.

Cold-Finished Steel Bars and Shafting.—Leading makers have announced an advance of $2 a ton, effective immediately and to apply on new business accepted for shipment during the remainder of this quarter. No action yet has been taken on fourth quarter prices, which will be governed

The Iron Age Composite Prices

Finished Steel

Aug. 14, 1928, 2.348c. a Lb.

One week ago	2.348c.
One month ago	2.319c.
One year ago	2.367c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products constitute 87 per cent of the United States output of finished steel.

	High		Low	
1928	2.364c.,	Feb. 14;	2.314c.,	Jan. 3
1927	2.453c.,	Jan. 4;	2.293c.,	Oct. 25
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	Apr. 24;	2.446c.,	Jan. 2

Pig Iron

Aug. 14, 1928, $17.04 a Gross Ton

One week ago	$17.04
One month ago	17.09
One year ago	18.13
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1928	$17.75,	Feb. 14;	$17.04,	July 24
1927	19.71,	Jan. 4;	17.54,	Nov. 1
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	Mar. 20;	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

Base Per Lb.

F.o.b. Pittsburgh mill.....1.85c. to 1.90c.
F.o.b. Chicago .....2.00c.
Del'd Philadelphia .....2.17c. to 2.22c.
Del'd New York.....2.19c. to 2.24c.
Del'd Cleveland .....2.04c. to 2.09c.
F.o.b. Cleveland .....1.85c.
F.o.b. Lackawanna .....1.95c. to 2.00c.
F.o.b. Birmingham .....2.05c.
C.i.f. Pacific ports.....2.35c.
F.o.b. San Francisco mills.....2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills.....1.95c. to 2.00c.
F.o.b. Birmingham .....2.05c. to 2.15c.

Rail Steel

F.o.b. mills east of Chicago district.....1.75c.
F.o.b. Chicago Heights mill.....1.85c.

Iron

Common iron, f.o.b. Chicago.....2.00c.
Refined iron, f.o.b. P'gh mills.....2.75c.
Common iron, del'd Philadelphia.....2.12c.
Common iron, del'd New York.....2.14c.

Tank Plates

Base Per Lb.

F.o.b. Pittsburgh mills.....1.85c. to 1.90c.
F.o.b. Chicago .....2.00c.
F.o.b. Birmingham .....2.05c.
Del'd Cleveland .....2.04c. to 2.09c.
Del'd Philadelphia .....2.10c. to 2.15c.
F.o.b. Coatesville .....2.00c. to 2.05c.
F.o.b. Sparrows Point.....2.00c.
F.o.b. Lackawanna .....1.95c. to 2.00c.
Del'd New York.....2.17½c. to 2.22½c.
C.i.f. Pacific ports.....2.25c. to 2.30c.

Structural Shapes

Base Per Lb.

F.o.b. Pittsburgh mills.....1.85c. to 1.90c.
F.o.b. Chicago .....2.00c.
F.o.b. Birmingham .....2.05c.
F.o.b. Lackawanna .....1.95c. to 2.00c.
F.o.b. Bethlehem .....2.00c. to 2.05c.
Del'd Cleveland .....2.04c. to 2.09c.
Del'd Philadelphia .....2.01c. to 2.18c.
Del'd New York.....2.14½c. to 2.19½c.
C.i.f. Pacific ports.....2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

Base Per Lb.

Narrower than 3 in., P'gh.....2.10c. to 2.20c.
From 3 in. to 6 in., P'gh.....1.85c. to 2.00c.
6 in. and wider, P'gh.....*1.75c. to 1.90c.
Narrower than 3 in., Chicago.....2.30c.
From 3 to 6 in., Chicago.....2.20c.
6 in. and wider, Chicago.....2.00c.
Cotton ties, f.o.b. Atlantic and Gulf ports:
Carlots per 45-lb. bundle.....$1.20
2000 bundle lots..... 1.25
Larger lots 1.23

*Mills follow plate or sheet prices according to gage on wider than 12 in.

Cold-Finished Steel

Base Per Lb.

Bars, f.o.b. Pittsburgh mills.....2.10c. to 2.20c.
Bars, f.o.b. Chicago.....2.10c.
Bars, Cleveland .....2.15c. to 2.25c.
Shafting, ground, f.o.b. mill.....*2.45c. to 2.90c.
Strips, 1 up to 3 tons, P'gh.....2.90c. to 3.00c.
Strips, 1 up to 3 tons, Cleveland.....2.90c.
Strips, 1 up to 3 tons, del'd Chicago.....3.30c.
Strips, 1 up to 3 tons, Worcester..3.15c. to 3.30c.
Fender stock, Pittsburgh.....4.10c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

Base Per Keg

Wire nails $2.55
Galvanized nails 4.55
Galvanized staples 3.25
Polished staples 3.00
Cement coated nails..... 2.55

Base Per 100 Lb.

Bright plain wire, No. 9 gage.....$2.40
Annealed fence wire..... 2.55
Spring wire 3.40
Galv'd wire, No. 9..... 3.00
Barbed wire, galv'd..... 3.20
Barbed wire, painted..... 2.95

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., (wire) mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Woven Wire Fence

Base to Retailers Per Net Ton

F.o.b. Pittsburgh $65.00
F.o.b. Cleveland 65.00
F.o.b. Anderson, Ind..... 66.00
F.o.b. Chicago district mills..... 67.00
F.o.b. Duluth 68.00
F.o.b. Birmingham 68.00

Sheets

Blue Annealed

Base Per Lb.

Nos. 9 and 10, f.o.b. P'gh.....2.00c. to 2.10c.
Nos. 9 and 10, f.o.b. Chicago dist. mill....2.10c.
Nos. 9 and 10, del'd Cleveland....2.09c. to 2.19c.
Nos. 9 and 10, del'd Philadelphia..2.32c. to 2.42c.
Nos. 9 and 10, f.o.b. Birmingham.....2.20c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh.....2.65c. to 2.75c.
No. 24, f.o.b. Chicago dist. mill...2.75c. to 2.85c.
No. 24, del'd Cleveland.....2.74c. to 2.84c.
No. 24, del'd Philadelphia.....2.97c. to 3.07c.
No. 24, f.o.b. Birmingham.....2.90c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade.3.85c. to 3.90c.
No. 24, f.o.b. Pittsburgh, B grade.3.65c. to 3.70c.

Galvanized

No. 24, f.o.b. Pittsburgh.....3.40c. to 3.60c.
No. 24, f.o.b. Chicago dist. mill...3.60c. to 3.70c.
No. 24, del'd Cleveland.....3.54c. to 3.69c.
No. 24, del'd Philadelphia.....3.72c. to 3.82c.
No. 24, f.o.b. Birmingham.....3.65c. to 3.70c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh.....2.85c. to 2.90c.
No. 28, f.o.b. Chicago dist. mill.....3.10c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh.....4.00c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill primes....4.10c.

Tin Plate

Per Base Box

Standard cokes, f.o.b. P'gh district mills...$5.25
Standard cokes, f.o.b. Gary..... 5.35

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)
(Per package, 20 x 28 in.)

8-lb. coating I.C.$11.20 | 25-lb. coating I.C.$16.70
15-lb. coating I.C. 14.00 | 30-lb. coating I.C. 17.75
20-lb. coating I.C. 15.30 | 40-lb. coating I.C. 19.85

Alloy Steel Bars

(F.o.b. maker's mill)
Alloy Quality Bar Base, 2.65c.

S.A.E. Series Numbers		Alloy Differential	Net Price 100 Lb. Bars
2000	(½% Nickel)	$0.25	$2.90
2100	(1½% Nickel)	0.55	3.20
2300	(3½% Nickel)	1.50	4.15
2500	(5% Nickel)	2.25	4.90
3100	Nickel Chromium	0.55	3.20
3200	Nickel Chromium	1.35	4.00
3300	Nickel Chromium	3.80	6.45
3400	Nickel Chromium	3.20	5.85
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50	3.15
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70	3.35
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel)	1.05	3.70
5100	Chromium Steel (0.60 to 0.90 Chromium)	0.35	3.00
5100	Chromium Steel (0.80 to 1.10 Chromium)	0.45	3.10
5100	Chromium Spring Steel	0.20	2.85
6100	Chromium Vanadium Bars	1.20	3.85
6100	Chromium Vanadium Spring Steel	0.95	3.60
9250	Silicon Manganese Spring Steel	0.25	2.90
	Chromium Nickel Vanadium	1.50	4.15
	Carbon Vanadium	0.95	3.60

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 down to and including 2½ in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

Slabs with sectional area of 16 in. or over carry the billet price; slabs with sectional area of 12 in. to 16 in. carry a $5 extra above the billet price and slabs with a sectional area under 12 in. carry the bar price.

Band sizes are 40c. per 100 lb. higher.

Rails

Per Gross Ton

Standard, f.o.b. mill.....$43.00
Light (from billets), f.o.b. mill..... 36.00
Light (from rail steel), f.o.b. mill..... 34.00
Light (from billets), f.o.b. Ch'go mill.... 36.00

Track Equipment

Base Per 100 Lb.

Spikes, ⅜ in. and larger..... $2.80
Spikes, ½ in. and smaller..... 2.80
Spikes, boat and barge..... 3.00
Tie plates, steel..... 2.15
Angle bars 2.75
Track bolts, to steam railroads.... $3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count.....70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ to ⅜..	+11	+39
¼ to ⅜..	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½..	30	13
1 to 3....	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6..	59	47½	2½	26	11
7 and 8...	56	43½	3 to 6....	28	13
9 and 10..	54	41½	7 to 12...	26	11
11 and 12.	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ to ⅜..	+19	+54
¼ to ⅜..	47	30½	½	21	17
½	53	42½	¾	28	12
¾	58	47⅛	1 to 1½..	30	14
1 to 1½..	60	49½			
2 to 3....	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4..	57	46½	2½ to 4..	29	15
4½ to 6..	56	45½	4½ to 6..	28	14
7 to 8....	52	39½	7 to 8....	21	7
9 and 10..	45	32½	9 to 12...	16	2
11 and 12.	44	31½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		*Charcoal Iron*	
2 to 2¼ in.....	27	1½ in. .....+18	
2½ to 2¾ in...	37	1¾ to 1⅞ in...+	8
3 in.	40	2 to 2¼ in....—	2
3¼ to 3¾ in...	42½	2½ to 3 in....—	7
4 to 13 in.....	46	3¼ to 4½ in...—	9

Beyond the above base discounts, the following extra discounts are given:

Lap Weld Steel		*Charcoal Iron*
Under 5000 lb..	4 Fives	1 Ten
5000 lb. to 12,000 lb.....	5 Fives	2 Tens
12,000 lb. to 21,000 lb.....	6 Fives	2 Tens & 2½
21,000 lb. and over	7 Fives	2 Tens & 5

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	63	3 in.	48
1¼ to 1½ in...	55	3¼ to 3½ in...	50
1¾ in.	39	4 in.	53
2 to 2¼ in.....	34	4½, 5 and 6 in..	45
2½ to 2¾ in....	42		

Hot Rolled

2 and 2¼ in....	40	3¼ and 3½ in..	56
2½ and 2¾ in..	48	4 in.	59
3 in.	54	4½, 5 and 6 in..	48

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Per Cent Off List

Carbon, 0.10% to 0.30%, base (carloads). 55
Carbon, 0.30% to 0.40%, base..... 50

Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

by the course of the hot-rolled bar market. Current specifications are running well ahead of ordinary experience at this time of the year.

Hot-Rolled Flats.—The past week has developed a fresh increase in specifications for hot-rolled strips and the month's business to date with most makers is running ahead of the same period last month. While prices still show a little irregularity, the trend in the main is in the direction of firmness, with a restoration of the regular schedules of 1.90c., base Pittsburgh, for 6-in. and wider, 2.10c. for 3 to 6-in. and 2.20c. for less than 3-in., the objective of most makers.

Cold-Rolled Strips.—Business, as typified by specifications on contracts, has improved materially. It is admitted that on some especially attractive business a base of 2.65c. per lb., Pittsburgh, for lots of 3 tons or more has been done, but generally 2.75c. is what is wanted on new tonnages for shipment over the remainder of this quarter.

Bolts, Nuts and Rivets.—Specifications are constant enough, but they are mostly for small lots and impose no tax upon productive capacity. Prices remain firm.

Coke and Coal.—The market is still rather bare of spot tonnages of beehive oven furnace coke, and, while demand is small, producers are having no trouble in making sales at $2.75 per net ton at ovens. Spot foundry coke is plentiful and is selling at the same prices that have ruled for several weeks. The coal market is a shade more active as a result of an increased demand for household requirements. Gas slack has stiffened slightly in price, but quotations otherwise are unchanged, due to the fact that the prospect of somewhat larger demand has caused resumptions by mines that have been idle. A request issued by local officials of the miners' union for a conference with former union mine operators for a discussion of a wage scale has received scant attention from the latter.

Old Material.—It develops that two steel makers in the district whose requirements as to quality are exacting have paid $16 for heavy melting steel, and a dealer short on this grade at another point in the district is reported to have paid even more to secure needed tonnages. The entire list is strong, and few grades have failed to reach higher levels than were current a week ago. Dealers are trying to buy heavy melting steel at $15 to cover sales, but are not having much success, and the real minimum price is $15.50. While there has been some mill buying, the upturn in the market essentially is the result of a panic among dealers who sold short and then became nervous over the moderate amount of material that was reaching the market. Offerings still are moderate, and it would seem as if still higher prices would be necessary to increase them. No scrap can reach this market from the West at present prices, because higher net returns are obtainable in Western consuming centers, and shipments from the East are hampered by the same conditions. It is easy to understand the scramble for railroad lists and the high prices they have brought in the past two months.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
Heavy melting steel	$15.00 to $16.00
Scrap rails	15.00 to 15.50
Compressed sheet steel	14.75 to 15.25
Bundled sheets, sides and ends	13.75 to 14.25
Cast iron carwheels	15.00 to 15.50
Sheet bar crops, ordinary	15.50 to 16.00
Heavy breakable cast	12.00 to 12.50
No. 2 railroad wrought	15.00 to 16.00
Heavy steel axle turnings	14.00 to 14.50
Machine shop turnings	10.00 to 10.50
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	16.00 to 16.50
Railr. coil and leaf springs	16.00 to 16.50
Rolled steel wheels	16.00 to 16.50
Low phos. billet and bloom ends	19.00 to 19.50
Low phos., mill plate	17.50 to 18.00
Low phos., light grade	16.50 to 17.00
Low phos. sheet bar crops	17.50 to 18.00
Hvy. steel axle turnings	14.00 to 14.50
Electric Furnace Grades:	
Low phos. punchings	16.00 to 16.50
Hvy. steel axle turnings	14.00 to 14.50
Blast Furnace Grades:	
Short shov'lg steel turnings	11.00 to 11.50
Short mixed borings and turnings	11.00 to 11.50
Cast iron borings	11.00 to 11.50
No. 2 busheling	10.00 to 10.50
Rolling Mill Grades:	
Steel car axles	18.25 to 18.75
No. 1 railroad wrought	12.00 to 12.50
Sheet bar crops	16.50 to 17.00
Cupola Grades:	
No. 1 cast	14.50 to 15.00
Rails 3 ft. and under	16.00 to 16.50

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c.
Hoops	4.00c. to 4.50c.
Black sheets (No. 24), 25 or more bundles	3.45c.
Galv. sheets (No. 24), 25 or more bundles	4.30c.
Blue ann'l'd sheets (No. 10), 1 to 10 sheets	3.35c.
Galv. corrug. sheets (No. 28), per square	$4.31
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count,	60 per cent off list
Machine bolts, 100 count,	60 per cent off list
Carriage bolts, 100 count,	60 per cent off list
Nuts, all styles, 100 count,	60 per cent off list
Large rivets, base per 100 lb.	$3.50
Wire, black soft ann'l'd, base per 100 lb.	$3.00 to 3.10
Wire, galv. soft, base per 100 lb.	3.00 to 3.10
Common wire nails, per keg	3.00
Cement coated nails, per keg	3.05

Austin Machinery Corporation in Receivership

The Austin Machinery Corporation, 2969 Lake Shore Drive, Muskegon, Mich., maker of concrete mixers, gasoline locomotives and contractors' equipment, with plants at Toledo, Ohio, Fairmont, W. Va., and Muskegon, has announced the voluntary appointment of a receiver with the contemplated payment of all creditors and continued operation of business.

Westinghouse Building Arc-Welding Laboratory

The Westinghouse Electric & Mfg. Co. has under construction at East Pittsburgh, Pa., an arc welding laboratory, which will be 75 ft. wide, 170 ft. long and 40 ft. high. In keeping with the purpose of the building, the steel frame is to be arc-welded instead of riveted. It will house a 50-ton crane and in addition to the installation of arc-welding equipment, will have massive rolling and forming equipment to be used for forming and shaping the various parts that go into welded machinery. These include motor frames, generator frames, motor rotor rims, and motor end bells.

W. S. Rugg, vice-president of the company, in discussing the possibilities of arc-welding exempts only two classes of structures from the inroads of arc welding. Those structures for which a fabricated steel construction cannot be justified are small pieces built in great quantities, such as the frames and brackets of small diameter motors and structures of such peculiar shape that they are not readily made from such commercial shapes of steel.

The company expects to weld turbine generator frames, locomotive frames, synchronous motor frames and spiders, boxes, machinery bases, floor plates and tanks, miscellaneous machinery parts, industrial heating apparatus, steel pipes, and shop furniture.

At the present time a 26-ton turbine generator frame entirely welded is being fabricated on the shop floors at East Pittsburgh. This generator, one of the largest in the country, will be installed in a New York station of the United Light & Power Co.

Ohio Employment Index Declined in July

In the iron and steel industries of Ohio the July employment index was 95, or 2 per cent less than in June, states the current bulletin of the Bureau of Business Research of Ohio State University. However, the index was 2 per cent higher than in July, 1927. Of the 169 reporting companies, 84 showed decreases in the number of wage earners, 76 increases, and 9 no change. In the machine tool group the standing in July was 4 per cent ahead of the June index of 101 and 25 per cent ahead of July, 1927. Of the 36 reporting concerns making special purpose machinery and appliances, 21 revealed a loss, 10 a gain, and five no change. The index for this group in July was 89, or 2 per cent less than in June.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over	$32.00 to $33.00
Rerolling, under 4-in. to and including 1¾-in.	33.00 to 34.00
Forging, ordinary	38.00
Forging, guaranteed	43.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer	$32.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger	$32.00 to $33.00
Smaller than 8 in. x 2 in.	33.00 to 34.00

Skelp

	Per Lb.
Grooved	1.85c. to 1.90c.
Sheared	1.85c. to 1.90c
Universal	1.85c. to 1.90c.

Wire Rods

	Per Gross Ton
*Common soft, base	$42.00
Screw stock	$5.00 per ton over base

*Chicago mill base is $43. Cleveland mill base, $42.

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15
Foreign Ore, c.i.f. Philadelphia or Baltimore	*Per Unit*
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	10.00c.
Iron ore, Swedish, average 66% iron,	9.25c. to 9.50c.
Manganese ore, washed, 52% manganese, from the Caucasus	39c.
Manganese ore, Brazilian, African or Indian, basis 50%	38c. to 39c.
Tungsten ore, high grade, per unit, in 60% concentrates	$10.85 to $11.00
	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00
	Per Lb
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.75
Foundry, f.o.b. Connellsville prompt	$3.50 to 4.25
Foundry, by-product, Ch'go ovens	8.00
Foundry, by-product, New England, del'd	11.00
Foundry, by-product, Newark or Jersey city, delivered	9.00 to 9.40
Foundry, Birmingham	5.00
Foundry, by-products, St. Louis, f.o.b. ovens	8.00
Foundry by-prod., del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.40 to $1.80
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Gas coal, ¾-in., f.o.b. Pa. mines	2.00 to 2.10
Mine run gas coal, f.o.b. Pa. mines	1.75 to 1.90
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.05
Gas slack, f.o.b. W. Pa. mines	1.15 to 1.20

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd	$105.00
Foreign, 80%, Atlantic or Gulf port, duty paid	105.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$33.00
Domestic, 16 to 19%	32.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50 to $88.50
75%	130.00 to 140.00

Per Gross Ton Furnace		*Per Gross Ton Furnace*	
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	45.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
10%	$30.00	12%	$34.00
11%	32.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
6%	$23.00	10%	$28.00
7%	24.00	11%	30.00
8%	25.00	12%	32.00
9%	26.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd	95c.
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton	$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per gross ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$17.00
No. 2 lump, Illinois and Kentucky mines	$18.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$16.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	$32.50

Fire Clay

Per 1000 f.o.b. Works

	First Quality	Second Quality
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	——
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	70
†Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagons	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.
†Bolts with rolled thread up to and including ¾ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages, Pittsburgh	80, 10 and 2½
Stove bolts in packages, Chicago	75, 20, 10 and 5
Stove bolts in bulk, Pittsburgh	80, 10 and 5
Stove bolts in bulk, Chicago	75, 20, 10, 5 and 2½
Tire bolts	60, 5 and 5

Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55 to 60 per cent apply.

Large Rivets

(½-In. and Larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.90
F.o.b. Chicago	3.00

Small Rivets

(7/16-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70 and 10
F.o.b. Cleveland	70 and 10
F.o.b. Chicago	70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 10
Milled standard set screws, case hardened,	80 and 10
Milled headless set screws, cut threads	80
Upset hex. head cap screws, U.S.S. thread,	85 and 5
Upset hex. cap screws, S.A.E. thread	85 and 5
Upset set screws	80, 10 and 10
Milled studs	70 and 5

Chicago

Mill Operations Sustained But Ingot Output Tapers—Sheet Prices Advanced

CHICAGO, Aug. 14.—The number of steel mill units in operation remains unchanged, but, due to the character of incoming business, output measured in tons of ingots is a shade lower than last week. Specifications, which in total volume compare favorably with the first week in August, for the most part are releases against lighter-tonnage commodities, so that one mill with all departments operating can attain only 75 per cent of its practical ingot rating. Opinion varies as to the outlook for shipments during the remainder of this month.

In the last seven days rail mill production has been speeded up a trifle, but fresh inquiry in sight does not appear to warrant a continuation of the present rate of output. The Texas-New Mexico Railway has petitioned for permission to lay 58 miles of new track near Kermit, Tex.

Deliveries against recent structural awards are growing smaller, and from present indications mills cannot hope to benefit materially from new railroad car business for 45 to 60 days.

Prices for finished steel are taking a firmer stand. The leading independent producer in this district has announced an advance of $2 a ton on black and galvanized sheets for delivery in the fourth quarter. Chicago quotations remain 2.15c. per lb. on blue annealed sheets, and no recognition is being given to strip mill widths. Sheet producers are falling in line in adopting the one-half of 1 per cent discount for cash, and wire manufacturers are considering making the same move.

Except for plates to be delivered in the Southwest there is less deviation than recently from 2c. per lb., Chicago, on bars, plates and shapes.

Pig Iron.—Buying, which is still active, has changed in character in that it is more evenly distributed over the entire district. A Chicago user has closed for 1000 tons of foundry iron and a nearby melter has taken 500 tons. To the west several sizable orders have been placed. Furnace stocks are pared closer, though some aid has been given to merchant iron sellers by the blowing in during July of a steel mill stack at Indiana Harbor. Stocks in the hands of producers are less well balanced than a month ago. It is reported that Ford will revert to the use of malleable castings, for which he had substituted forgings. A sale of silvery in this district has brought out a price below the commonly quoted market.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$17.50
N'thn' No. 1 fdy., sil. 2.25 to 2.75	18.00
Malleable, not over 2.25 sil.	17.50
High phosphorus	17.50
Lake Super. charcoal, sil. 1.50	27.04
So'th'n No. 2 fdy. (all rail)	21.51
So'th'n No. 2 (barge and rail)	21.01
Low phos., sil. 1 to 2, copper free	$28.50 to 29.00
Silvery, sil. 8 per cent	29.79
Bess. ferrosilicon, 14-15%	46.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—This market is quiet, affording little opportunity to test prices except in carlot sales. Contracts recently received obligate practically all large users of ferromanganese for the remainder of the year.

Prices delivered Chicago: 80 per cent ferromanganese, $112.56; 50 per cent ferrosilicon, $83.50 to $87.50; spiegeleisen, 19 to 21 per cent, $40.76.

Structural Material. — Fabricators in this district are well engaged, several of the larger shops having backlogs of seven to eight weeks. Both awards and fresh inquiries are light, but the future is promising. The list of pending projects is impressive, and financial arrangements on promotional schemes are making progress. For the most part architects are busy. One office alone is preparing plans for five structures that will average 3000 tons each. Mill deliveries on plain material range from two to five weeks. Prices are moderately firm at 2c., Chicago.

Mill prices on plain material, per lb.: 2c., base, Chicago.

Plates.—In a week that is quiet from the viewpoint of sales, local mills are concentrating on meeting the exacting delivery requirements of pipe makers, who recently have ordered over 40,000 tons of plates, and fabricators, who are hurrying through their shops the first shipments on projects that now have reached the state of steel erection. Tank steel ordered this week totals 1000 tons, and it is reported that 3000 tons of plates needed for water pipe in Oklahoma City, Okla., has been placed by a local contractor with an Eastern producer. The Texas & Pacific, which was reported to have been in need of 12,000 tons of plates, now is preparing plans for either six 150,000-bbl. tanks or 12 80,000-bbl. tanks, which will require about 3000 tons of steel. The Chicago, Burlington & Quincy will require over 500 tons of steel for the 33 suburban coaches that it intends to build in its own shops.

Mill prices on plates, per lb.: 2c., base, Chicago.

Bars.—Individual orders for soft steel bars are small but numerous and from practically every class of user. A seasonal letdown in demand from manufacturers of agricultural machinery is not apparent, and readjustments in the automobile trade do not appear to have diminished demand for steel from that source. Specifications from forgers are liberal. Prices for soft steel bars are stiffening, 2c., Chicago, being the ruling quotation. The rate of shipments of alloy steel bars is undiminished, and output in this territory is steady. Prices are firm and alloy differentials are holding. Iron bar mills are operating on a hand-to-mouth basis and far below capacity. Current orders are being taken at 2c., Chicago. Improvement is noted in users' needs for rail steel bars. Both new business and specifications are coming from a wider range of buyers. Sales and shipments during the first two weeks in August were ahead of the corresponding period a year ago. Fall fence post business is slowly getting under way, but it will be three or four weeks before it reaches its full stride. The bulk of going tonnage is being taken at 1.85c., Chicago Heights, but small orders at 1.90c. are more numerous.

Mill prices per lb.: Soft steel bars, 2c., base, Chicago; common bar iron, 2c., base, Chicago; rail steel bars, 1.85c., base, Chicago Heights mill.

Sheets.—Chicago producers are announcing, effective for the fourth quarter, advances of $2 a ton on black and galvanized sheets. The new prices will be 2.90c., delivered Chicago, for black sheets, and 3.75c. for galvanized. Blue annealed sheets will remain unchanged at 2.15c., Chicago, and no differentials will be recognized in strip mill widths. There has been wider adoption of a cash discount of one-half of 1 per cent, effective Oct. 1, in place of the present 2 per cent. The volume of new business is such that it is believed by some that a considerable tonnage purchased at third quarter prices will be carried over into the last three months of the year. One noticeable effect of the announcement of higher prices for next quarter is the stiffening of prevailing quotations. Specifications are more liberal, and hot mill schedules are better arranged, though hot weather is preventing output from climbing.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 2.80c. to 2.90c.; No. 24 galv., 3.65c. to 3.75c.; No. 10 blue ann'l'd, 2.15c. Deliv'd prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than Chgo. deliv'd prices.

Reinforcing Bars. — A flurry of lower prices occurred during the early part of last week. Several low quotations made their appearance and at least one or two were promptly met. Prices are stiffening again and appear to have returned to levels that prevailed before the dip. It is reported that bids on the general contract for five junior high schools at Chicago have been rejected and the jobs will be readvertised. A similar move is said to be holding in check the General Electric Co.'s building project in Chicago. French inquiry is dragging, but architects are busy and dealers in reinforcing bars are looking forward to a substantial volume of business in the late summer and early fall months.

Rails and Track Supplies.—A Western railroad has closed for 3000 tons of standard-section rails for early delivery. Orders in recent weeks have forced producers to speed up output

a trifle. Miscellaneous business in track fastenings aggregates 2500 tons, and a Southern railroad has bought 500 tons of iron tie plates. Fresh inquiry for rails totals 3000 tons.

Prices f.o.b. mill, per gross ton: Standard-section open-hearth and Bess. rails, $43; light rails, rolled from billets, $36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.15c.; angle bars, 2.75c.

Cold-Rolled Strip.—Demand is sustaining an output at 80 per cent of capacity. Prices for 1 up to 3-ton lots are steady at 3.30c., base, per lb., delivered at Chicago.

Wire Products.—Noteworthy in this market is a sharp increase in demand for wire nails. Purchases have been the heaviest in months and shipments are measurably larger. Jobbers in rural districts are finding wire business dull, though in some sections of the country demand for nails has created renewed interest. Railroad orders for wire products are normal for this time of the year. Although there has been some readjustment here and there in the manufacturing trade, the net volume of business being entered at the mills is little changed from the last month or two. Reports from east of the Mississippi River show that stocks in the hands of users are in some cases normal, but in most instances small, ranging from seven to 10 days' supply. Mill operations, after dropping to 60 per cent of capacity, now give promise of expanding, as producers anticipate an active fall trade, which is expected to get under way early in September. Mill stocks are of fair size and well rounded.

Old Material.—Although in size and number sales in this market are not impressive, nevertheless the firmness in prices developed recently has held and on some grades quotations have advanced. A purchaser has paid $15.15 a gross ton, delivered, for 2000 tons of re-rolling rails, and a round tonnage of shoveling steel brought $13.37 delivered. Special grades of heavy melting steel have brought as high as $13 to $13.25 for the No. 1 grade. Higher prices being paid by brokers have stimulated the movement of yard scrap. This situation is affording opportunity for making a closer comparison between production and demand. Some sellers foresee a shortage in several grades. Railroad shipments are heavy and prompt. Lists offered this week include 3500 tons by the Rock Island, 2000 tons by the Grand Trunk and 1000 tons by the Chicago & Alton.

Prices deliv'd Chicago district consumers:

Per Gross Ton

Basic Open-Hearth Grades:	
Heavy melting steel	$12.75 to $13.25
Shoveling steel	12.75 to 13.25
Frogs, switches and guards, cut apart, and misc. rails	13.75 to 14.25
Hydraul. compressed sheets	11.25 to 11.75
Drop forge flashings	9.50 to 10.00
Forg'd, cast and r'l'd steel carwheels	15.50 to 16.00
Railr'd tires, charg. box size	15.50 to 16.00
Railr'd leaf springs cut apart	15.50 to 16.00
Acid Open-Hearth Grades:	
Steel couplers and knuckles	13.75 to 14.25
Coil springs	15.75 to 16.25
Electric Furnace Grades:	
Axle turnings	12.50 to 13.00
Low phos. punchings	14.25 to 14.75
Low phos. plate, 12 in. and under	14.25 to 14.75
Blast Furnace Grades:	
Axle turnings	9.00 to 9.50
Cast iron borings	9.25 to 9.75
Short shoveling turnings	9.00 to 9.50
Machine shop turnings	6.00 to 6.50
Rolling Mill Grades:	
Iron rails	13.50 to 14.00
Rerolling rails	14.75 to 15.25
Cupola Grades:	
Steel rails less than 3 ft.	15.25 to 15.75
Angle bars, steel	15.00 to 15.50
Cast iron carwheels	12.75 to 13.00
Malleable Grades:	
Railroad	13.00 to 13.50
Agricultural	11.50 to 12.00
Miscellaneous:	
*Relay'g rails, 56 to 60 lb.	23.00 to 25.00
*Relay'g rails, 65 lb. and heav.	26.00 to 31.00

Per Net Ton

Rolling Mill Grades:	
Iron angles and splice bars	13.50 to 14.00
Iron arch bars and transoms	19.50 to 20.00
Iron car axles	24.00 to 24.50
Steel car axles	15.50 to 16.00
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	11.50 to 12.00
No. 1 busheling	9.50 to 10.00
No. 2 busheling	5.75 to 6.25
Locomotive tires, smooth	12.00 to 12.50
Pipes and flues	8.00 to 8.50
Cupola Grades:	
No. 1 machinery cast	14.00 to 14.50
No. 1 railroad cast	13.00 to 13.50
No. 1 agricultural cast	12.50 to 13.00
Stove plate	10.75 to 11.25
Grate bars	11.50 to 12.00
Brake shoes	10.00 to 10.50

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Cast Iron Pipe.—Chicago will take bids Aug. 20 on 1920 tons of 6 and 12-in. Class B pipe. Noteworthy among awards for the week is 2200 tons of 6 and 8-in. Class B and 12-in. Class C pipe, which was purchased by St. Clair Shores, Mich., from the McWane Cast Iron Pipe Co. Contractors are more active in the Chicago district. They have ordered a round tonnage in the last seven days and will soon close for 2000 to 3000 tons of additional pipe. Small orders, including business taken from the railroads, are more numerous. It is reported that Highland Park, Ill., will soon award a general contract for supplying and laying about 400 tons of cast iron pipe. Prices are firm at $34 to $35, Birmingham, for 6-in. and larger diameters.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, $42.20 to $43.20; 4-in., $46.20 to $47.20; Class A and gas pipe, $4 extra.

Bolts, Nuts and Rivets.—An oil tank program being undertaken by the Texas & Pacific will require close to 300 tons of large rivets. Prices for this commodity are moderately steady at Chicago at $3, base, per 100 lb. Recent sales in the Southwest, however, point to unsteadiness in that direction.

Cold-Finished Bars. — Announcement at Pittsburgh of a price advance of $2 a ton has had no effect on this market, where producers continue to quote 2.10c. per lb., Chicago. Specifications are in large volume, and output is near capacity.

Coke.—Shipments have gained a trifle in keeping with improvement in foundry business. Prices are steady and all ovens in this district are lighted.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforc'g bars, billet steel	2.30c. to 3.00c.
Reinforc'g bars, hard steel	2.00c. to 2.70c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands	3.65c.
Hoops	4.15c.
Black sheets (No. 24)	3.80c.
Galv. sheets (No. 24)	4.65c.
Blue ann'l'd sheets (No. 10)	3.35c.
Spikes, stand. railroad	3.55c.
Track bolts	4.55c.
Rivets, structural	3.60c.
Rivets, boiler	3.60c.
	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, sq., tap. or blank	60
Hot-pressed nuts, hex., tap. or blank	60
No 8 black ann'l'd wire, per 100 lb.	$3.30
Com. wire nails, base per keg	3.10
Cement c't'd nails, base per keg	3.10

Steel Corporation's Orders Decreased in July

Unfilled orders on the books of the United States Steel Corporation decreased in July. The total on July 31 was 3,570,927 tons, compared with 3,637,009 tons on June 30—a decrease of 66,082 tons. On July 31, 1927, the corresponding total was 3,142,014 tons. The table gives the reported figures for the last 19 months.

		1928	1927
Jan.	31	4,275,947	3,800,177
Feb.	28	4,398,189	3,597,119
Mar.	31	4,335,206	3,553,140
April	30	3,872,133	3,456,132
May	31	3,416,822	3,050,941
June	30	3,637,009	3,053,246
July	31	3,570,927	3,142,014
Aug.	31	.....	3,196,037
Sept.	30	.....	3,148,113
Oct.	31	.....	3,341,040
Nov.	30	.....	3,454,444
Dec.	31	.....	3,972,874

At the end of April, 1917, the highest total in unfilled orders of the Steel Corporation ever attained was reported at 12,183,193 tons. The lowest figure ever reported was 2,754,757 tons, Dec. 31, 1910.

Trackwork Output Lower in July

Production of trackwork in the United States for July showed a seasonal falling off from the average of the second quarter. According to the American Iron and Steel Institute statistics, the total of switches, switch stands, frogs, crossings, guard rails and appurtenances laid last month for T-rail track of 60 lb. per yd. and over was 11,776 net tons against 13,716 tons in June and 41,368 tons for the second quarter of the year. July trackwork in 1927 was 13,217 tons and the total for the second quarter of 1927 was 48,406 tons.

Philadelphia

Sheet Mills Increase Width on Which Blue Annealed Base Applies—General Demand Slackens

PHILADELPHIA, Aug. 14.—The flow of steel orders, which was in unusually good volume through most of July and the first week of the present month, has been smaller in the past week, but this is explained in some quarters by the fact that it is midsummer and at the peak of the vacation season. Mills are sufficiently well covered to carry them through a few quiet weeks, and prices on plates, shapes and bars are unchanged, with shapes showing greater firmness. Sellers are beginning seriously to consider 2c., Pittsburgh, on bars and 2.15c., Coatesville, on plates as quotations for fourth quarter, although buyers are not expected to show much interest in material for that delivery for another month or more. The Pennsylvania Railroad will open bids Aug. 21 on estimated requirements of about 25,000 tons of plates, shapes and bars. Individual tonnages of each product are not specified in its inquiry, but as a rule two-thirds or more of the total is plates.

A large sheet producer has announced an advance of $2 a ton for fourth quarter to 2.75c., Pittsburgh, on black, and 3.50c., Pittsburgh, on galvanized, maintaining blue annealed at 2c. to 2.10c., Pittsburgh, depending upon the width. Several sheet mills have announced a change in the widths of blue annealed sheets on which the 10c. extra applies, the price of 2c. now being for sheets 45 in. and narrower, instead of applying only to sheets 40 in. and narrower. This action was taken, it is said, because increased widths are being offered by continuous mills.

Ferromanganese. — Requisitions against contracts are coming out freely, and there is a small volume of orders for carload lots. Quotations continue at $105 per ton, seaboard.

Bars.—Demand has tapered, but prices are unchanged at 1.85c., Pittsburgh, or 2.17c., Philadelphia, for desirable specifications, and 1.90c., Pittsburgh, or 2.22c., Philadelphia, for small lots for prompt shipment. Mills are well booked with tonnage and are beginning seriously to consider 2c., Pittsburgh, as a basis for fourth quarter business. Local projects requiring reinforcing bars are small, ranging from specifications for a few tons to less than 100 tons in most cases.

Shapes.—The market is rather inactive, but prices have a slightly firmer tone, 1.95c., Pencoyd, Pa., or 2.01c., Philadelphia, being less common and 2c., Pencoyd, or 2.06c., Philadelphia, to 2c., Bethlehem, or 2.13c., Philadelphia, being more representative of the current market.

Plates.—Mills are fairly well filled with orders and are maintaining prices at 2c. to 2.05c., Coatesville, or 2.10c. to 2.15c., Philadelphia. Sellers are seriously considering 2.15c., Coatesville, or 2.25c., Philadelphia, as a fourth quarter price, although at present consumers are not interested in future buying.

Pig Iron.—Buying of foundry iron is limited to lots ranging from a carload to a few hundred tons, on which $19.50 per ton, base furnace, applies. Following the recent sizable purchase of basic by a Coatesville consumer, no immediate activity in this grade is expected. Small tonnages of Buffalo iron continue to be sold to eastern Pennsylvania consumers. Low phosphorus iron is quiet. Virginia iron prices are unchanged, but one of the large Virginia cast iron pipe plants is in the market for a sizable tonnage and, with Birmingham furnaces quoting on a basis of about $15.50 per ton, furnace, the Virginia maker may find it necessary to quote $19.50 per ton, or lower.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	$20.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	20.76
East. Pa. No. 1X	21.26
Basic (del'd east. Pa.)	$18.75 to $19.25
Gray forge	19.75 to 20.25
Malleable	21.00 to 21.50
Stand. low phos. (f.o.b. N. Y. State furnace)	22.00 to 23.00
Cop. b'r'g low phos. (f.o.b. furnace)	23.00 to 23.50
Va. No. 2 plain, 1.75 to 2.25 sil.	24.54
Va. No. 2X, 2.25 to 2.75 sil.	25.04

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

Sheets.—For current delivery mills are still quoting 2c., Pittsburgh, or 2.32c., Philadelphia, for blue annealed; 2.65c., Pittsburgh, or 2.97c., Philadelphia, for black, and 3.40c., Pittsburgh, or 3.72c., Philadelphia, for galvanized. Some mills are quoting a $2 a ton advance on black and galvanized for fourth quarter and several producers, including the leading interest in this district, are now quoting 2c. per lb., Pittsburgh, on widths 45 in. and narrower and 2.10c., Pittsburgh, on wider than 45 in., in contrast with the former differential on sheets wider than 40 in. This change is attributed to the fact that continuous sheet mills are now able to offer wider material. Reduction of the discount for cash to ½ of 1 per cent for payment in 10 days by several sheet mills is evidently meeting with considerable opposition from distributers, but general action along this line by all producers is expected by Oct. 1.

Warehouse Business.—The total of orders thus far in August is reported as slightly smaller than in the early part of July, but prices are firm, including the $2 a ton advance on bars and bar-sized shapes of Aug. 1.

Imports.—In the week ended Aug. 11 a total of 11,950 tons of iron ore arrived at this port from Algeria. Pig iron receipts totaled 1078 tons, of which 658 tons came from India, 267 tons from Norway and 153 tons from the Netherlands. Steel imports consisted of 710 tons of structural shapes and 6 tons of steel bands from Belgium, 263 tons of shapes from France and 78 tons of shapes from Germany. Steel scrap imports totaled 11 tons, from the United Kingdom.

Old Material.—Most grades of scrap show a firmer tendency, although prices are in most cases unchanged. Bundled sheets show an advance of 50c. a ton, on a small purchase by a Harrisburg consumer at $10.50 a ton, and heavy breakable cast has been bought by the same mill at $15 and $15.50, delivered. Stove plate is quotable at $11 to $11.50, a small tonnage having been bought recently at $11.50, delivered eastern Pennsylvania. Part of the present firmness in scrap prices seems to be a reflection of the stronger market situation in the Pittsburgh district.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$13.00
Scrap T rails	12.50
No. 2 heavy melting steel	$10.50 to 11.00
No. 1 railroad wrought	13.50 to 14.50
Bundled sheets (for steel works)	10.00 to 10.50
Machine shop turnings (for steel works)	10.00 to 10.50
Heavy axle turnings (or equiv.)	12.00 to 13.00
Cast borings (for steel works and roll. mill)	10.00 to 10.50
Heavy breakable cast (for steel works)	15.00 to 15.50
Railroad grate bars	11.00 to 11.50
Stove plate (for steel works)	11.00 to 11.50
No. 1 low phos., hvy., 0.04% and under	17.50 to 18.00
Couplers and knuckles	14.50 to 15.00
Rolled steel wheels	14.50 to 15.00
No. 1 blast f'nace scrap	9.50 to 10.00
Wrot. iron and soft steel pipes and tubes (new specific.)	12.00 to 12.50
Shafting	16.50 to 17.00
Steel axles	19.00 to 20.00
No. 1 forge fire	11.00
Cast iron carwheels	15.50 to 15.75
No. 1 cast	15.50 to 16.00
Cast borings (for chem. plant)	14.50 to 15.00
Steel rails for rolling	14.50 to 15.00

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.50c. to 2.60c.
Plates, ⅜-in.	2.80c. to 3.00c.
Structural shapes	2.40c. to 2.60c.
Soft steel bars, small shapes, iron bars (except bands)	2.70c.
Round-edge iron	3.50c.
Round-edge steel, iron finished 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforc. steel bars, sq. twisted and deform.	2.50c. to 3.00c.
Cold-fin. steel, rounds and hex.	3.35c.
Cold-fin. steel, sq. and flats	3.85c.
Steel hoops	3.50c.
Steel bands, No. 12 to ⅜-in., inclus.	3.25c.
Spring steel	5.00c.
*Black sheets (No. 24)	3.85c.
†Galvanized sheets (No. 24)	4.60c.
Blue ann'l'd sheets (No. 10)	3.15c.
Diam. pat. floor plates—	
¼-in.	5.30c.
⅜-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

*For 50 bundles or more; 10 to 49 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.
†For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

New York

Pig Iron Buying Continues Heavy—Three Subway Sections to Take 29,000 Tons of Steel

NEW YORK, Aug. 14.—Demand for pig iron remains heavy. While an increase in foundry melt is evident, there are also indications that large purchases are being made because buyers regard present prices low. Not counting purchases estimated at 20,000 to 30,000 tons by a large maker of heating equipment, sales in this territory for the week totaled over 16,000 tons. The Thatcher Co. closed for about 6000 tons of No. 2 plain for its Garwood, N. J., plant, buying both eastern Pennsylvania and Buffalo iron. The largest new inquiry is from the General Electric Co., calling for close to 5000 tons for fourth quarter shipment. For Bayway, N. J., this company wants 425 tons each of No. 1X and No. 2X; for Lynn, Mass., 400 tons of 3.25 to 3.75 per cent silicon foundry; for Everett, Mass., 400 tons of No. 1X; for Pittsfield, Mass., 600 tons of foundry analyzing 3 per cent and over in silicon; for Schenectady, N. Y., 1000 tons of No. 1X and No. 2X, and for Erie, Pa., 1500 tons. Buyers who have had attractive tonnages to offer have been able to secure low delivered prices, partly on account of barge rates and partly because of selling pressure. Because of the heavy grain movement, barges are scarce and water rates are advancing, with less than $2.50 a ton from Buffalo to New York harbor hard to obtain. It is understood, however, that accumulations of barge iron at New Jersey ports, moved at lower rates, have been sold in large blocks. One seller continues to quote No. 2X at $19.51, eastern New Jersey tidewater. This is presumably barge iron on the basis of $16.50, Buffalo, to which $2 has been added for the water movement and handling charges and $1.01 for the railroad freight between such points as Jersey City and Newark and Elizabethport and Newark. At certain points in New Jersey, taking an all-rail rate of $3.28 from Buffalo, there is little or no economy in buying barge iron. Pig iron selling is more of a study of freight rates than ever before, and aggregate sales of barge iron are much larger than in previous years. One important Buffalo interest that had planned to accumulate a stock at a New Jersey port has been unable to do so because of steady current demands for deliveries. Making allowance for the various combinations of rates, the base price of foundry iron at Buffalo is substantially unchanged at $16 to $16.50. Eastern Pennsylvania foundry iron for delivery in this district, however, has weakened, less than $18.50, furnace, having been done on a large purchase. The Adrian Furnace Co., Dubois, Pa., plans to blow in its stack shortly. There continues to be a demand for Dutch and Indian irons, although they are not competitive with domestic metal on a price basis. Dutch foundry in No. 1X and lower silicon grades is quoted at $21 to $21.50, duty paid port of entry.

Prices per gross ton, deliv'd New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	$20.91 to $21.41
*Buf. No. 2, del'd east. N. J.	19.28 to 19.78
No. 2, del'd east. N. J. tidewater	19.01 to 19.51
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	19.89 to 21.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	20.39 to 22.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	20.89 to 22.52

†Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.

*Price delivered to New Jersey cities having rate of $3.28 a ton from Buffalo.

Ferroalloys.— Demand for ferromanganese is very light, but specifications on contract are heavy. A fair business is reported in carload and small lots of spiegeleisen which is quoted at $33, furnace, for the 19 to 21 per cent alloy, and at $32, furnace, for the 16 to 19 per cent grade.

Plates, Shapes and Bars.—With new buying practically negligible, little or no change in the price situation has been noticed in the last week. Consumers are well covered for the present quarter, many of them at prices $1 to $2 a ton under 1.90c., Pittsburgh, for bars, and 2.05c., Bethlehem, for shapes, but on spot business the higher prices are fairly well adhered to. However, it is still possible to buy plates at 2.17½c., New York, or 2c., Coatesville. Buyers are showing no interest in fourth quarter requirements, and it will be another month before the higher prices announced for that period can be tested. Structural business continues in large volume, and many important projects are pending on which early settlement is expected. With specifications coming in on the heavy sales of June and July, mill schedules are well filled and deliveries are lengthening. Fabricating prices are stronger. Three sections of the New York subway, calling for 29,000 tons of shapes, have come out for bids, and a 4000-ton section has been placed. Action is expected this week on the Reynolds Building, New York, which will take nearly 17,000 tons. The Structural Steel Board of Trade reports July structural lettings in the New York metropolitan district, exclusive of bridges, subway work, etc., of 70,000 tons. This compares with 38,000 tons in the previous month and is the highest monthly total since July, 1927, when awards amounted to 73,000 tons.

Mill prices per lb., deliv'd New York: Soft steel bars, 2.19c. to 2.24c.; plates, 2.12½c. to 2.22½c.; struct. shapes, 2.14½c. to 2.19½c.; bar iron, 2.14c.

Sheets and Strips.—Announcement of a $2 a ton advance in black and galvanized sheet prices for the fourth quarter has been made by several independent producers. This will make quotations on black sheets 2.75c. per lb., Pittsburgh, and galvanized, 3.50c., while blue annealed will remain at 2c., for widths up to 45 in., and 2.10c. for the wider sizes. Business, particularly specifications on old contracts, is showing considerable improvement over July, and the higher fourth quarter prices are expected to bring in large tonnages. There has also been some improvement in the demand for strip steel, and prices are steady at 2.90c. to 3c., Pittsburgh and

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.30c.
Soft steel bars, small shapes	3.25c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds and hexagons	3.40c.
Flats and squares	3.90c.
Cold-roll. strip, soft and quarter hard	5.15c. to 5.40c.
Hoops	4.50c.
Bands	4.00c.
Blue ann'l'd sheets (No. 10)	3.85c. to 3.90c.
Long terne sheets (No. 24)	5.60c. to 5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases,	4.50c. to 7.00c.

	Per Cent Off List
Machine bolts, cut thread:	
¾ x 6 in. and smaller	60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	60
¾ x 20 in. and smaller	50 to 50 and 10
Coach screws:	
½ x 6 in. and smaller	60
1 x 16 in. and smaller	50 to 50 and 10

Boiler Tubes—	Per 100 Ft.
Lap welded, 2-in.	$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discount on Welded Pipe

Standard Steel—	Black	Galv.
⅛-in. butt	46	29
¼-in. butt	51	37
1-3-in. butt	53	39
2½-6-in. lap	42	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
⅛-in. butt	5	+19
¼-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per Box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 in.)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	3.60c. to 3.80c.
No. 22	3.75c. to 3.95c.
No. 24	3.80c. to 4.00c.
No. 26	3.90c. to 4.10c.
No. 28*	4.05c. to 4.25c.
No. 30	4.30c. to 4.50c.

Sheets, Galvanized

	Per Lb.
No. 14	4.15c. to 4.35c.
No. 16	4.00c. to 4.20c.
No. 18	4.15c. to 4.35c.
No. 20	4.30c. to 4.50c.
No. 22	4.35c. to 4.55c.
No. 24	4.50c. to 4.70c.
No. 26	4.75c. to 4.95c.
No. 28*	5.00c. to 5.20c.
No. 30	5.40c. to 5.60c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Cleveland, on the cold-rolled product, and 1.75c. to 2.20c., Pittsburgh, for the hot-rolled material.

Pipe.—An oil company with headquarters in New York is inquiring for 18,000 tons of oil well pipe for shipment to South America. Other large projects are in prospect and the market for this material is expected to be active throughout the remainder of the year. The high rate of building activity in this district is reflected in the steady demand for standard butt-weld pipe.

Reinforcing Bars.—The first two weeks of the month have shown considerable improvement over July both in lettings and in new work in prospect. Nearly 2000 tons is included in jobs of 100 tons or more placed in the last week, the largest being a high school at White Plains, N. Y., which took 500 tons, and a factory building at Norwalk, Conn., calling for 400 tons. At least 3000 tons has been added to pending work. Distributers in this territory are no longer quoting mill prices except in exceptional cases, and the Pittsburgh warehouse price of 2.15c. per lb., or 2.49c., on cars at New York, seems to be definitely established. The practice of not shipping cut-to-length from mills except in 40, 50 and 60-ft. lengths has been generally adopted. Out of New York warehouse the common quotations are 2.80c. per lb. for lots of 5 tons or more, 2.95c., for lots of 2 to 5 tons and 3.24c. for less than 2 tons, all delivered at job.

Cast Iron Pipe.—Southern makers of pressure pipe are still out of this market at present prices of $34 to $35 per ton, base Birmingham, and a $9.25 freight rate into this district. Northern foundries continue to quote $37.60 to $38.60 per ton, delivered New York. Atlantic City, N. J., opens bids Aug. 16 on 4500 tons of 60-in. Class A pipe. Hartford, Conn., opened bids Aug. 11 on 150 tons of 8-in. and 325 tons of 12-in. Class D pipe, with alternate prices on Class 250 centrifugal pipe.

Prices per net ton, deliv'd New York: Water pipe 6-in. and larger, $37.60 to $38.60; 4-in. and 5-in., $42.60 to $43.60; 3-in., $52.60 to $53.60; Class A and gas pipe, $4 to $5 extra.

Warehouse Business.—Current buying is confined to small orders, but total bookings compare favorably with those of last month. Competition of foreign material is still encountered in sales of bars and shapes, but lately there has been a slight decrease in the activity of sellers of imported steel, probably as a result of higher prices in European markets. The sheet market is being maintained with only occasional concessions from the range of 3.80c. to 4c. per lb., base, for black and 4.50c. to 4.70c., base, for galvanized.

Coke.—Furnace grade continues to show decided firmness, partly as a result of curtailment of operations and partly because of the purchase last week by a Pittsburgh steel interest of 10 additional carloads a day from several Connellsville producers. For delivery through next month $2.75 to $2.85 per net ton is quoted, but the usual price for shipment beyond Oct. 1 is close to $3 a ton. Connellsville foundry coke for prompt shipment is quoted at about $3.75, Connellsville. Special brands are unchanged at $4.85, ovens, or delivered into this district; $8.56 per net ton to northern New Jersey, Jersey City and Newark and $9.44 to New York and Brooklyn. By-product foundry coke is unchanged at $9 to $9.40, Newark or Jersey City, and $10.06 to $10.29, New York or Brooklyn.

Old Material.—Prices are developing decided firmness and in some cases are slightly higher based on recent sales at advances of 50c. a ton. Holders of scrap are seeking higher prices from brokers and it is reported to be increasingly difficult to obtain material. Recently a consumer at Harrisburg, Pa., bought heavy breakable cast, stove plate and bundled sheets, and, on the basis of these new contracts, brokers are offering $15 per ton for heavy breakable cast, $11 per ton for stove plate and $10 per ton for bundled sheets, delivered to Harrisburg. While there has been no change in the price of heavy melting steel delivered eastern Pennsylvania, some dealers are shipping their steel into the Pittsburgh district, receiving $15 to $15.30 per ton, delivered, on a $5.30 freight rate, or $9.70 to $10 per ton, New York. The eastern Pennsylvania price is unchanged at $12.50 per ton, delivered. Brokers are buying foundry stove plate at $10.75 per ton, delivered West Mahwah, N. J., which has a $2.02 freight rate, and at $11 per ton delivered Bayonne, N. J., which has a $1.89 freight rate.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel	$9.00 to	$9.85
Heavy melting steel (yard)	6.75 to	7.25
No. 1 hvy. breakable cast.	10.75 to	11.25
Stove plate (steel works)..	6.75 to	7.25
Locomotive grate bars....	6.75 to	7.25
Machine shop turnings....	6.25 to	6.50
Short shoveling turnings..	6.25 to	6.50
Cast borings (blast furn. or steel works).....	6.00 to	6.50
Mixed borings and turnings	6.00 to	6.50
Steel car axles.....	15.00 to	15.50
Iron car axles.....	23.50 to	24.00
Iron and steel pipe (1 in. dia., not under 2 ft. long)	8.25 to	8.75
Forge fire	6.50 to	6.75
No. 1 railroad wrought...	9.00 to	9.50
No. 1 yard wrot., long....	7.50 to	8.00
Rails for rolling.....	10.00 to	10.50
Cast iron carwheels.....	11.00 to	12.00
Stove plate (foundry)....	8.75 to	9.00
Malleable cast (railroad).		10.00
Cast borings (chemical)...	10.75 to	11.25

Prices per gross ton, deliv'd local foundries:

No. 1 machy. cast.....	$14.00 to	$15.00
No. 1 hvy. cast (columns, bldg. materials, etc.), cupola size	12.00 to	13.00
No. 2 cast (radiators, cast boilers, etc.)	11.50 to	12.50

Cleveland

Finished Steel Prices Have Firmer Tone—Pig Iron Sales Total 84,000 Tons

CLEVELAND, Aug. 14.—The demand for finished steel is holding up unusually well for August. Mills are getting a good volume of specifications against contracts for steel bars. Structural material is fairly active, and plates are moving quite well in small lots. Several of the automobile manufacturers are under heavy production on new models, and the demand from that source is good for this season of the year. Orders for alloy steel bars are in sufficient volume to keep the leading Ohio manufacturer in operation close to capacity, and some of the sheet and hot-rolled strip mills have nearly as much tonnage on their books as earlier in the season, when the operations of automotive industry were larger. While structural lettings in the building field are not numerous, some good tonnage is coming out for bridge work.

The market continues to show a firmer tone on the heavier rolled products. While most consumers of steel bars and structural material are under contract at 1.85c., a moderate volume of small-lot business is being placed and outside mills are holding more closely to 1.90c., Pittsburgh.

A local producer is still quoting steel bars at 1.85c., Cleveland. On plates 1.85c., Pittsburgh, is still rather commonly named, although some small-lot business is being taken at 1.90c.

The Wheeling & Lake Erie Railway has purchased 1000 tons of rails from a Pittsburgh district mill, this order being supplemental to one placed for a similar tonnage reported last week.

In pig iron an active buying movement has developed.

Pig Iron.—Sales increased sharply in the past week. Cleveland interests sold 84,000 tons of pig iron in foundry and malleable grades, making the week one of the best of the year in volume of business. Buying was quite well distributed, though the automotive industry took a good percentage of the tonnage. While there was a good volume of early shipment orders, the larger part of the business was in contracts covering the remainder of the year. There was also some buying for the fourth quarter by consumers that had already covered for the present quarter. Many foundries evidently feel that they can now forecast their requirements over the remainder of the year and, believing that prices are on rock bottom, see no advantage in postponing buying until later. The tone of the market is firmer. While there has been no advance in prices, furnaces are not showing the disposition to shade quotations in competitive territories that they did a few weeks ago. Cleveland producers claim to be holding firmly to $16.50, furnace, for foundry and

malleable iron for outside shipment and are taking some business at that price. In Michigan there is a range of $17.50 to $18, furnace, shading of the lower price, which recently developed in a few cases, having disappeared. For Cleveland delivery the market is steady at $17.50, furnace. Shipping orders are very good and show a little gain over July. Among new inquiries is one from the General Electric Co. for 1500 tons of foundry iron for its Erie, Pa., works.

Prices per gross ton at Cleveland:

N'th'n fdy., sil. 1.75 to 2.25	$18.00
S'th'n fdy., sil. 1.75 to 2.25	21.50
Malleable	18.00
Ohio silvery, 8 per cent	28.00
Basic Valley furnace	16.00
Stand. low phos., Valley furn	26.50

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

Iron Ore.—Lake shipments are holding up to recent volume. The ore balance on Lake Erie docks Aug. 1 was 5,385,007 tons, compared with 5,459,497 tons on the same date a year ago. Receipts at these docks during the month were 6,078,181 tons and for the season 15,124,977 tons, compared with 17,848,739 tons during the same period a year ago. Shipments from Lake Erie docks during July were 4,110,864 tons and for the season 11,410,116 tons, against 13,809,271 tons during the same period last year. Receipts at other Lake ports during July were 2,655,181 tons, compared with 2,281,622 tons during the same period last year.

Semi-Finished Steel.—Specifications are holding up to the recent good volume, and the leading local merchant producer continues to operate at 100 per cent of capacity. There is virtually no new business, as practically all consumers are under contract. Prices are steady at $32 to $33, Cleveland, for sheet bars, billets and slabs.

Bolts, Nuts and Rivets.—Orders are fair for August, having fallen but slightly below July in volume. The automotive industry, implement manufacturers and jobbers continue to specify fairly freely for bolts and nuts. Makers of nuts and bolts are operating at about 60 per cent of capacity.

Coke.—The demand for foundry coke is slow, and prices are unchanged at $7.75, Painesville, for Ohio by-product coke and $3.50 to $4.85, ovens, for Connellsville foundry coke. Local by-product domestic coke is quoted at $6, delivered Cleveland, for egg size.

Warehouse Prices f.o.b. Cleveland

	Base per Lb.
Plates and struct. shapes	3.00c.
Soft steel bars	3.00c.
Reinforc. steel bars	2.25c.
Cold-fin. rounds and hex	3.65c.
Cold-fin. flats and sq	4.15c.
Hoops and bands	3.65c.
Cold-finished strip	*5.95c.
Black sheets (No. 24)	3.40c.
Galvanized sheets (No. 24)	4.25c.
Blue ann'l'd sheets (No. 10)	3.25c.
No. 9 ann'l'd wire, per 100 lb	$2.85
No. 9 gal. wire, per 100 lb	3.30
Com. wire nails, base per keg	2.85

*Net base, including boxing and cutting to length.

Sheets.—Orders from the automotive industry are keeping up well, and the demand from other industries shows a gain. Consumers have allowed their stocks to run low and are buying for quick delivery. While the low prices that have appeared for some time are still being named, they are less common than a few weeks ago. Strong efforts will be made to get prices on a higher basis for the fourth quarter, and some mills have already announced advances for that delivery. Galvanized sheets are still available at 3.40c., Pittsburgh, and 3.45c., Valley. Mills are holding to 2.60., Pittsburgh, on black sheets and to 1.90c. on blue annealed.

Strip Steel.—Specifications for hot-rolled strip are good, and the market has a firmer tone in that mills are able in some cases to sell small lots at better than the ruling round-lot price of 1.75c. Cold-rolled strip is rather slow. The demand for this product has been lessened by the increased use on automobiles of one-piece fenders that are made entirely of full-finished sheets. While 2.75c., Cleveland, has been shaded $2 a ton in Detroit, that price appears to be holding in this territory.

Wire Products.—The demand is moderate. While published quotations appear to be holding in most sections, shading to $2.35, Cleveland, on wire and $2.50 on nails is reported in some localities.

Reinforcing Bars.—The demand is light, and price shading continues on billet steel bars for local delivery. Rail steel bars are unchanged at 1.75c., mill.

Warehouse Business.—Orders, particularly for steel bars and structural material, show a gain over July. A lull is reported in the demand for sheets. Prices generally are firm except on reinforcing bars.

Old Material.—The market has a firmer tone, brought about by more liberal releases by local mills against old contracts. While there is no buying by mills, dealers having old orders to fill are being asked higher prices and, although resisting an advance, they have in some cases paid a little more for scrap than recently. No. 1 heavy melting steel has sold in small lots up to $13.25, and machine shop turnings, at $7.50, a 25c. a ton advance on both grades. Purchases of blast furnace scrap were made at $9.10.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$13.00 to $13.25
No. 2 heavy melting steel	12.25 to 12.50
Compressed sheet steel	12.00 to 12.50
Light bundled sheet stamp'gs	11.50 to 11.75
Dron forge flashings	11.25 to 11.50
Machine shop turnings	7.25 to 7.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	13.50 to 13.75
No. 1 busheling	10.50 to 11.00
Pipes and flues	9.00 to 9.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades	
Low phos. forging crops	16.00 to 16.50
Low phos., billet, bloom and slab crops	17.00 to 17.50
Low phos. sheet bar crops	16.50 to 17.00
Low phos. plate scrap	15.50 to 16.00
Blast Furnace Grades	
Cast iron borings	9.00 to 9.25
Mixed bor'gs and short turn'gs	9.00 to 9.25
No. 2 busheling	9.00 to 9.25
Cupola Grades	
No. 1 cast	16.00 to 16.50
Railroad grate bars	11.00 to 12.00
Stove plate	12.00 to 12.50
Rails under 3 ft	16.75 to 17.25
Miscellaneous	
Railroad malleable	15.00 to 15.50
Rails for rolling	16.25 to 16.50

Hyb-lum—A New Light Aluminum Alloy

A new aluminum alloy has been placed on the market by the Sheet Aluminum Corporation, Jackson, Mich. It is described as "a balanced aluminum alloy, fundamentally new in composition and in application." It is claimed for this alloy that it combines lightness and strength to a greater degree than any other workable product ever developed on a commercial scale. The new alloy is named "Hyb-lum," protected under United States patent No. 1,579,481.

Research and experimental work was done by Victor N. Hybinette, Jr., with the advice and assistance of his father, an authority on non-ferrous metals. Prior to the introduction of Hyb-lum, the alloying elements of aluminum have been chiefly copper, manganese, silicon and magnesium. In the new alloy, nickel and metals of the chromium group are employed. The total addition of all heavy metals is given as approximately 2 per cent.

Among the qualities claimed for the new alloy are these properties: non-tarnishing, non-corrodibility, resistance to inter-crystalline corrosion, chemical resistivity, welding quality, strength and plasticity, non-fatigue, low specific gravity, wide limits of temperature in heat treatment and stability after heat treatment, even at elevated temperatures.

The alloy is white, or silver like, without the grayish blue cast of aluminum. It takes a brilliant and lasting polish. It is manufactured in four different classes—A, B, C and D—with the composition virtually the same in all. They vary in physical properties according to annealing, hard rolling to different tempers, cold working and heat treatment. The alloy, it is added, is weldable by means of gas or the electric arc.

Iron Ore Distribution in 1927

In the charts showing the sources and distribution of iron ore in 1927, reproduced on page 357 of THE IRON AGE of Aug. 9, it seems that two errors were made in connection with rail shipments. The Lake Superior Iron Ore Association, which has headquarters at Cleveland, says that the all rail shipments from the Gogebic range should be 150,000 and not 450,000 tons as indicated, and similarly the all rail shipments from the Menominee range should be 10,000 and not 100,000 tons.

San Francisco

Structural Shapes Most Active Product in Coast Markets—Low Prices on Reinforcing Steel

SAN FRANCISCO, Aug. 11 (*By Air Mail*).—August steel sales continue at a fair rate and show improvement over the volume booked last month. Included among the larger lettings of the week were 590 tons of reinforcing bars for the Big Dalton dam at Los Angeles, placed with the Pacific Coast Steel Co., and 455 tons of structural shapes for a bridge at Saugus, Cal., awarded to Claude Fisher Co., Los Angeles. Prices, however, from the viewpoint of the mill and the fabricator are far from satisfactory. Extremely low quotations on reinforcing bars out-of-stock continue in the San Francisco district.

Pig Iron.—Most of the melters have fair-sized stocks and are not keenly interested in the market. Prices are unchanged.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah fdy., sil. 2.75 to 3.25	25.00 to 26.00
**Indian fdy., sil. 2.75 to 3.25	24.00 to 25.00

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Bars.—In addition to the Big Dalton dam project mentioned above, Culver City, Cal., placed 459 tons for a storm drain with Braun, Bryant & Austin. Including smaller awards the total for the week exceeded 2000 tons. New inquiries call for 500 tons for an apartment on Vine Street, Los Angeles, and 160 tons for a bridge at Maupin, Ore. Out-of-stock quotations continue at low levels, and while 2c. is occasionally obtained, most of the business is going at around 1.85c. This compares with a c.i.f. price on domestic structural steel of 2.35c. Merchant bar demand remains quiet; the majority of sales and inquiries call for less than carload lots.

Plates.—Only two inquiries of over 100 tons are up for figures. These involve 7200 tons of 5/16 to ⅜-in. materials for water mains in Oakland for the East Bay Municipal Utility District, bids on which will be opened Aug. 17, and 103 tons for a 36-in. pipe line for the Belle Fourche project in South Dakota for the Bureau of Reclamation, on which the Western Pipe & Steel Co. of San Francisco is low bidder. The Navy Department has placed 131 tons for the Mare Island yard with an eastern producer. Quotations range from 2.20c. to 2.30c., the former price being quoted by one or two of the small independent producers.

Shapes.—Structural steel continues the most active product on the coast. Awards this week were in excess of 2300 tons. The Minneapolis Steel & Machinery Co. was awarded 650 tons for a high school at Great Falls, Mont. The Star Iron & Steel Works took 350 tons for a chemical plant at Tacoma and the McClintic-Marshall Co. booked 140 tons for a bridge at Sargent, Cal. Considerable new work is planned and architects expect to have working drawings on them completed within the next 60 days. These projects, together with those now up for figures, will exceed 25,000 tons. New inquiries include 250 tons for a hangar at Oakland, 170 tons for an apartment in San Mateo, Cal., and 170 tons for a bridge at Maupin, Ore. Shapes are firm at 2.35c., c.i.f.

Cast Iron Pipe.—W. J. Tobin, Oakland, secured the only award of over 100 tons. This project called for 416 tons of 4 to 12-inch class B pipe for Tracy, Cal. Bids were opened this week on 23,247 tons for Dallas, Tex., and bids will be opened next week on 22,325 tons for distributing mains in Oakland for the East Bay Municipal Utility District. On the latter project alternate bids on different types of pipe will be taken. Compton, Cal., opened bids this week on 148 tons of 2 and 4-in. class B pipe. Los Angeles has come into the market for 318 tons of 2-in. class B pipe, bids to be opened Aug. 14. On Aug. 27, San Diego, Cal., will open bids on 147 tons of 6 to 10-in. class C pipe for the improvement of Garnet Street.

Coke.—Movement of coke has not been heavy of late as foundry operations, especially among the jobbing classes of plants, have shown little or no improvement during the past 30 days and stocks on hand in foundry yards are apparently sufficient to take care of immediate requirements. English beehive is quoted at $16 a net ton, incoming dock, and by-product coke ranges from $11.50 to $13.00 a net ton.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes	3.15c.
Soft steel bars	3.15c.
Small angles, 3/16-in. and over	3.15c.
Small angles, under 3/16-in.	3.55c.
Small channels and tees, ¾-in. to 2¾-in.	3.75c.
Spring steel, ¼-in. and thicker	5.00c.
Black sheets (No. 24)	5.00c.
Blue ann'l'd sheets (No. 10)	4.00c.
Galv. sheets (No. 24)	5.40c.
Struc. rivets, ½-in. and larger	5.65c.
Com. wire nails, base per keg	$3.40
Cement c't'd nails, 100-lb. keg	3.40

Birmingham

Pig Iron Shipments Keep Pace with Production—Steel Buying Holds Up Well

BIRMINGHAM, Aug. 14.—A fair amount of new pig iron tonnage, mostly for August, is coming in, but the market is not active. Buying is for early melt. Present bookings of merchant producers cover most of August and September production. Quotations continue at the $15.50 base. Shipments thus far in August are keeping pace with production. In July the three merchant producers reduced their yard stocks, shipping more than they made. No changes have been made in furnace operations during the past three weeks. Seventeen are in blast, eight on foundry, seven on basic, one on ferromanganese and one on recarburizing iron. The Gulf States Steel Co. furnace, now being built, will not be ready until the latter part of next month. The second of the two new blast furnaces of the Tennessee company at Fairfield has been completed but is not in operation.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil.	$15.50
No. 1 fdy., 2.25 to 2.75 sil.	16.00
Basic	$15.00 to 16.00

Finished Steel.—New business and inquiries are holding up well and continue above the midsummer average. July bookings were above those of the same month last year and also slightly ahead of those in June. August is expected to show similar improvement. Prices are stationary. Structural steel fabricators report a quiet week. Fifteen open-hearth furnaces are being operated, the Tennessee company having six on at Fairfield and five at Ensley; the Gulf States Steel Co., three at Alabama City. The rod mill of Gulf States Steel Co. has been closed down for change from steam to electric power. Operations will be resumed the latter part of this month.

Cast Iron Pipe.—Very little new tonnage was booked by the pressure pipe plants during the past week. No awards of any consequence were placed. Operations are steady and at the same rate as for some weeks past. Plant activity so far this month has been largely based on tonnage secured in July. Quotations for third quarter deliveries remain around $34 to $35. The soil pipe market is still unsatisfactory and has changed but little.

Old Material.—Gradual improvement is being felt in certain lines, such as No. 1 cast and steel scrap. This has now been noticeable for several weeks. Demand is said to be slightly better. No changes in prices occurred during the past week.

Prices per gross ton, deliv'd Birmingham dist. consumers' yards:

Heavy melting steel	$8.50 to	$9.00
Scrap steel rails	11.00 to	11.50
Short shoveling turnings	7.50 to	8.00
Cast iron borings		8.00
Stove plate		13.50
Steel axles	19.00 to	20.00
Iron axles	21.00 to	22.00
No. 1 railroad wrought	10.00 to	10.50
Rails for rolling		13.00
No. 1 cast		14.00
Tramcar wheels	12.50 to	13.50
Cast iron carwheels	12.00 to	13.00
Cast iron borings, chem	13.50 to	14.00

St. Louis

Pig Iron Shipments in Satisfactory Volume—But New Buying Is Light—Scrap Slightly Firmer

ST. LOUIS, Aug. 14.—While purchasing of pig iron is not in impressive volume, shipments since the first of this month and specifications against contracts have been satisfactory. Certain melters, notably implement makers and some specialty manufacturers, are busy and in need of raw material. Consumers' stocks generally are low, in some instances considerably under normal even for this time of year. Reserves at blast furnaces serving this district have also been cut, and there is less anxiety to sell than early in the summer. The leading district producer is not pushing fourth quarter sales and is firmer on business for the rest of this quarter. Sales reported totaled 5200 tons, the largest 2000 tons of malleable to an East Side plant. A Kansas jobbing foundry took 400 tons and an Iowa specialty maker engaged 600 tons; the rest was scattered in 50 to 200-ton lots among users in Missouri, Illinois, Iowa and Indiana.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$18.50 to $19.00
N'th'n No. 2 fdy., deliv'd St. Louis.	19.66
Southern No. 2 fdy., deliv'd	19.92
Northern malleable, deliv'd	19.66
Northern basic, deliv'd	19.66

Freight rates: 81c. Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Coke.—The extreme hot weather has caused a slowing down in metallurgical coke, and new buying is at a minimum. Shipments, however, continue to make a fair showing, there being few requests for holdups. Local by-product oven stocks are larger than they were 30 days ago, but not above normal for this season. Prices are unchanged.

Finished Iron and Steel.—Warehousemen report business since the first of this month about up to expectations, with some departments better than looked for. Building material is in good demand, both in the district proper and in the surrounding trade area. Railroads have been swamped with offerings of grain and have kept their shops busy on emergency repairs of box cars. This is reflected in buying by the carriers of a variety of shop supplies. Sheets continue quite active, with the call coming from diversified sources. Sales of small quantities of concrete reinforcing material are reported, but the only jobs of note were 165 tons for the Missouri Baptist Sanitarium, St. Louis, and 275 tons for a hotel at Eighth and Market Streets, St. Louis, both going to the Laclede Steel Co. Fabricators of structural steel are working on old orders, but report no new lettings of consequence.

Old Material.—For the first time in a number of weeks scrap iron and steel dealers report a firmer tone to the market. This is due to higher quotations in Chicago and further east rather than to increased buying by the industries here. Few sales are recorded. Stocks, however, are light, and any increase in demand could easily be reflected in an upturn in values. In face of the lack of demand, railroads continue to unload scrap, and, singularly enough, are receiving good prices, conditions considered. Latest lists include: Southern Railway, 14,056 tons; Wabash, 2905 tons; Ann Arbor, 532 tons; Great Northern, 83 cars; Nickel Plate, 21 cars; Kansas City Southern, 281 tons; Chicago & Alton, 1240 tons; Texas Pacific, 490 tons; Chesapeake & Ohio, 3562 tons; Frisco, 10 cars, and Louisville & Nashville, 15,978 tons.

Dealers' buying prices, per gross ton, f.o.b. St. Louis district:

Heavy melting steel	$10.50 to $11.00
No. 1 locomotive tires	11.75 to 12.00
Heavy shoveling steel	10.50 to 11.00
Miscell. stand.-sec. rails, includ'g frogs, sw'ches and guards, cut apart	12.00 to 12.50
Railroad springs	13.00 to 13.50
Bundled sheets	7.75 to 8.25
No. 2 railroad wrought	11.00 to 11.50
No. 1 busheling	9.00 to 9.50
Cast iron borings	8.25 to 8.75
Iron rails	13.00 to 13.50
Rails for rolling	13.00 to 13.50
Machine shop turnings	7.00 to 7.50
Steel car axles	18.00 to 18.50
Iron car axles	25.50 to 25.75
Wrot. iron bars and trans.	18.25 to 18.75
No. 1 railroad wrought	9.00 to 9.50
Steel rails, less than 3 ft.	15.00 to 15.50
Steel angle bars	11.75 to 12.25
Cast iron carwheels	13.00 to 13.50
No. 1 machinery cast	13.00 to 13.50
Railroad malleable	11.50 to 12.00
No. 1 railroad cast	13.00 to 13.50
Stove plate	11.00 to 11.50
Agricult. malleable	11.50 to 12.00
Relay. rails, 60 lb. and under	20.50 to 23.50
Relay. rails, 70 lb. and over	26.50 to 29.00

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-fin. rounds, shafting, screw stock	3.75c.
Black sheets (No. 24)	4.45c.
Galv. sheets (No. 24)	5.25c.
Blue ann'l'd sheets (No. 10)	3.60c.
Black corrug. sheets (No. 24)	4.50c.
Galv. corrug. sheets	5.30c.
Structural rivets	3.75c.
Boiler rivets	3.75c.
	Per Cent Off List
Tank rivets, 7/16-in. and smaller, 100 lb. or more	70
Less than 100 lb	65
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-press. nuts, sq., blank or tapped, 200 lb. or more	60
Less than 200 lb	50
Hot-press. nuts, hex., blank or tapped, 200 lb. or more	60
Less than 200 lb	50

Canada

Hotel at Halifax Takes 10,000 Tons of Steel—Like Tonnage Needed for Toronto Building

TORONTO, ONT., Aug. 14.—Interest in the Canadian pig iron markets showed more life during the past week. Foundry and malleable iron sales were in larger volume than in the week previous. Some inquiry is out for last quarter iron. Orders for 500 and 600-ton lots have been closed for delivery this month by water, and it is understood that this iron will be for late fall and winter consumption. Pig iron prices are unchanged.

Prices per gross ton:

	Delivered Toronto
No. 1 fdy., sil. 2.25 to 2.75	$23.10 to $23.60
No. 2 fdy., sil. 1.75 to 2.25	23.10 to 23.60
Malleable	23.10 to 23.60
	Delivered Montreal
No. 1 fdy., sil. 2.25 to 2.75	24.50 to 25.00
No. 2 fdy., sil. 1.75 to 2.25	24.50 to 25.00
Malleable	24.50 to 25.00
Basic	23.50 to 24.00
	Imported Iron, Montreal Warehouse
Summerlee	33.50
Carron	33.00

Structural Steel.—The general increase in building activities is reflected in a strong demand for structural steel and reinforcing bars. Among the larger contracts awarded in the week was that for the new Canadian National station and hotel at Halifax, N. S., involving 10,000 tons of structural steel, which went to the Dominion Bridge Co., Ltd. The Canadian Bank of Commerce, Toronto, will shortly award contracts in connection with a proposed office building to be erected at King and Jordan Streets; about 10,000 tons of steel will be required.

Old Material.—Sales for the week showed some improvement over those of the first few days of the month. Heavy melting steel and turnings are moving freely into this district, and some buying of machinery cast and rails has been reported. The weakness in prices of a week or two ago has almost entirely disappeared.

Dealers' buying prices:

	Per Gross Ton	
	Toronto	Montreal
Heavy melting steel	$9.00	$7.00
Rails, scrap	10.00	9.00
No. 1 wrought	9.00	11.00
Machine shop turnings	7.00	5.00
Boiler plate	7.00	6.00
Heavy axle turnings	7.50	6.50
Cast borings	7.50	5.00
Steel turnings	7.00	5.50
Wrought pipe	5.00	5.00
Steel axles	14.00	20.00
Axles, wrought iron	16.00	22.00
No. 1 machinery cast	....	16.00
Stove plate	....	13.00
Standard carwheels	....	16.00
Malleable	....	13.00
	Per Net Ton	
No. 1 machinery cast	15.00	....
Stove plate	9.00	....
Standard carwheels	13.00	....
Malleable scrap	13.00	....

The Georgia Manganese & Iron Co., Atlanta, Ga., has been organized to develop manganese properties at Cartersville, Ga. Perin & Marshall, consulting engineers of New York, are in charge of the experimental work now going on.

Boston

Heavy Melting Scrap Higher in More Active Market—More Interest in Pig Iron

BOSTON, Aug. 14.—While pig iron sales in the past week probably did not exceed 6000 tons—made up of 2000 tons of Mystic, 2000 tons of Buffalo iron and the rest divided between New York State, western Pennsylvania, Alabama and Indian brands—more interest is being shown in supplies, as attested by a comparatively large number of sales ranging from car lots to 300 tons. Most of the iron sold recently was for fourth quarter shipment; the average foundry has enough on hand and on contract to carry it through the third period. Despite reports from other districts of a firmer undertone to prices, No. 2X iron from the Buffalo district, in car lots, is still available in New England at $16.50 a ton, furnace, and No. 1X, at $17. These prices can be shaded on round tonnages. It is reported that bidding for barges has raised water rates. Pig iron prices, however, are as yet unaffected. Indian iron is selling at $21.25 to $21.75 a ton on dock here, duty paid.

Foundry iron prices per gross ton deliv'd to most New England points:

*Buffalo, sil. 1.75 to 2.25	$20.91 to	$21.41
*Buffalo, sil. 2.25 to 2.75	21.41 to	21.91
†Buffalo, sil. 1.75 to 2.25	19.78 to	20.28
†Buffalo, sil. 2.25 to 2.75	20.28 to	20.78
East. Penn., sil. 1.75 to 2.25	23.15 to	23.65
East. Penn., sil. 2.25 to 2.75	23.65 to	24.15
Va., sil. 1.75 to 2.25		25.71
Va., sil. 2.25 to 2.75		26.21
Ala., sil. 1.75 to 2.25	22.41 to	24.27
Ala., sil. 2.25 to 2.75	22.91 to	24.77

Freight rates: $4.91 all rail and $3.78 rail and water from Buffalo; $3.65 from eastern Pennsylvania; $5.21 all rail from Virginia; $6.91 to $8.77 from Alabama.
*All rail rate. †Rail and water rate.

Imports.—Imports of pig iron at this port in July totaled 596 tons, all from India, whereas importations in the previous month were 800 tons, and in July last year, 1979 tons. Imports of ore in July were 9800 tons, all from Newfoundland, as against 18,731 tons in June and 30,852 tons in July, last year.

Coke.—New England by-product foundry coke remains at $11 a ton, delivered, within a $3.10 freight rate zone, that price having been in effect since June 1. Deliveries on contracts are running about on a par with those for July, the best month so far this year. One maker is about a day behind on shipments. The same manufacturer's August deliveries of domestic coke are 50 per cent ahead of those for the same period in July, largely as a result of the installing of new screening equipment.

Cast Iron Pipe.—No open municipal pipe business has been closed. Private sales to cities, towns and companies are holding up well, however, and prices on such business are firm. Newton, Mass., has closed bids on 150 tons of 6-in. pipe but has made no award. The range on 4-in. pipe is $45.10 to $46.10 a ton, delivered common Boston freight rate points, and on 6-in. to 12-in., $41.10 to $42.10. The usual $5 differential is asked on Class A and gas pipe.

Warehouse Business. — Warehouse deliveries in the first half of August are about equal to those for the first half of July, and exceed those of the same period in August, 1927. Stocks are well balanced but not heavy. It is still intimated that warehouse prices are to be higher, but nobody has taken the initiative, owing to the keen competition for business.

Old Material. — Reflecting higher prices in the Pittsburgh district, the local market for heavy melting steel is more active and now ranges from $8.50 to $9 a ton, on cars shipping point, with an occasional sale at $9.25, contrasted with $8 to $8.50 a week ago. In addition to domestic business, there continues an export demand. One steamer has virtually finished loading 7000 to 7500 tons of steel for Italy. Another boat has started loading 3600 tons for Danzig. The freight rate on this lot is $5.25 a ton. The Pittsburgh Testing Laboratory is inspecting the material for the shippers. No. 1 steel for export remains at $9.25 a ton on dock here, and No. 2 at $8.50 to $8.75. Pipe is a little more active, with indications of being higher shortly. More orders for steel turnings, forge fire scrap and No. 1 machinery cast have been moved of late, but not in large quantities. The Boston & Maine Railroad yesterday closed bids on about 35 cars of miscellaneous material.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$8.50 to	$9.25
Scrap T rails	7.50 to	8.00
Scrap girder rails	7.25 to	7.50
No. 1 railroad wrought	8.50 to	9.00
No. 1 yard wrought	7.00 to	7.50
Machine shop turnings	5.00 to	5.50
Cast iron borings (steel works and rolling mill)	5.00 to	5.50
Bundled skeleton, long	6.50 to	7.00
Forge flashings	6.50 to	7.00
Blast furnace borings and turnings	5.00 to	5.50
Forge scrap	5.50 to	6.00
Shafting	11.50 to	12.00
Steel car axles	14.50 to	15.00
Wrought pipe 1 in. in diameter (over 2 ft. long)	7.00 to	7.50
Rails for rolling	9.50 to	10.00
Cast iron borings, chemical	9.50 to	10.00
Prices per gross ton deliv'd consumers' yards:		
Textile cast	$13.50 to	$14.00
No. 1 machinery cast	14.00 to	14.50
No. 2 machinery cast	12.50 to	13.50
Stove plate	10.00 to	10.50
Railroad malleable	13.50 to	14.50

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars, small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway, squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tie steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hex	*3.45c. to 5.45c.
Squares and flats	*3.95c. to 6.95c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.50c.

	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot pressed nuts	50 and 5
Cold-punched nuts	50 and 5
Stove bolts	70 and 10

*Including quantity differentials.

Pacific Northwest

Structural Steel and Reinforcing Projects Fairly Active—Inquiry for Plates Improved

SEATTLE, Aug. 11 (*By Air Mail*).—A fair amount of new structural steel work is in sight, including 650 tons for Prince Rupert docks of the Canadian National Railways; two State highway bridges, one of 415 tons and the other of 445 tons, bids on which are to be opened Aug. 14; new buildings for the Hooker Chemical Co., Tacoma, Wash., 700 tons, bids to be called for shortly, and 145 tons for the Second Avenue extension, Seattle. Other fair-sized jobs are in sight, and it is believed the last three or four months of the year will be quite active.

Plates.—New inquiry for plates is better. On Aug. 13 Tacoma, Wash., is to open bids for 330 tons for extensions to water lines, while Edmonds, Wash., is in the market for 52,000 ft. of 4-in. to 12-in. pipe, bids to be asked in a week or two. Tank quality plates are quoted at 2.20c. to 2.25c., Seattle.

Bars.—Demand for reinforcing steel bars is more active. The Pacific Coast Steel Co. has taken 250 tons for an Everett, Wash., department store, about 100 tons for an addition to the Seattle Ice Cream Co.'s plant, 80 tons for an apartment in Seattle and 80 tons for a bridge at Nisqually, Wash. Contract for the Hanford Street tunnel has been awarded to George Nelson, a Seattle contractor, and it is expected that in a week or ten days contract will be awarded for 700 tons of reinforcing steel for this project.

Warehouse Business.—Local jobbers report that July was a very fair month, and so far August is just as good. One jobber has sent out new price cards under date of Aug. 1, in which prices of galvanized sheets have been reduced 25c. per 100 lb.; small rounds and squares have been advanced from 3c. to 3.50c.; angles ⅛-in. thick are up 50c. per 100 lb.

Cincinnati

Pig Iron Market Stronger—Heavy Melting Scrap Advances —Southern Coke Invades District

CINCINNATI, Aug. 14.—Pig iron producers and distributing houses are encouraged by the indications of a stronger and more active market. Northern producers have either raised their prices or are contemplating such action. One maker has circularized an advance of 50c. a ton. Recent sales by other manufacturers have been at better prices. This is true of both Lake and interior Ohio irons. Cleveland foundry iron, at least with one producer, is quoted at $16.50, furnace, a price also named at a Columbus, Ohio, furnace. Southern furnaces are reported as having delayed opening books for the fourth quarter, and some business is reported as having been lost in consequence. This is also regarded as an indication that the sellers are not willing to take the prices prevailing in the face of what looks like a rising market. As yet, however, no change in prices has been announced in the South. An inquiry is current in this market for 250 tons of Southern iron. The only sizable inquiry is from a southern Ohio buyer for 500 to 1500 tons of Northern iron. One Cincinnati sales office sold 5500 tons in small lots, the largest being 250 tons, and another reported bookings of 1100 tons, the largest order being 200 tons. Sales were scattered over southern Indiana and Ohio. Prices remain at current quotations except that Northern iron is now quoted by several producers at $16.50, furnace.

Prices per gross ton, deliv'd Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$19.89
So. Ohio malleable	$20.14 to 20.89
Ala. fdy., sil. 1.75 to 2.25	19.19
Ala. fdy., sil. 2.25 to 2.75	19.69
Tenn. fdy., sil. 1.75 to 2.25	19.19
So'th'n Ohio silvery 8 per cent	26.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Finished Material.— Demand for heavy steel products has been well sustained in the past week, specifications on current contracts having been especially liberal. Bars, shapes and plates are steady at 1.90c., base Pittsburgh, for small miscellaneous lots for immediate delivery, attractive tonnages still being sold in some cases at 1.85c. Fabricators in this district are operating at a fair rate, and gas holder builders have recently booked orders which necessitate an increase in production. Sheet manufacturers report that specifications and fresh bookings have again turned upward after a short period during which incoming business fell off considerably. Unfilled orders are sufficient to insure sheet mill operations at close to 90 per cent of capacity during the next week. Meanwhile, prices have become better stabilized. Blue annealed stock is quoted at 1.90c. to 2c., base Pittsburgh, black sheets at 2.65c. to 2.75c. and galvanized at 3.40c. The wire market apparently is firmer, with common wire nails selling at a minimum of $2.69 per keg, delivered Cincinnati, or $2.55, Ironton.

Coke.—Reports continue that the Birmingham coke sellers are invading this territory, especially southern Indiana, where a price of $3, ovens, has been quoted, while in Ohio outside the Cincinnati territory the prices named are from $3 to $3.50, ovens, and in the Cincinnati territory, $4.25 to $5. Current prices locally have not changed. Foundry coke shipments are continuing at the rate reached at the close of July.

Old Material.—The scrap market has been improving, and prices of some grades have advanced. Inquiry is active with buyers bidding up prices. Dealers refuse to consider offers for heavy tonnages at the current market, being unwilling to sell large tonnages in the face of a rising market, especially for deferred or long term delivery. Prices again advanced this week 25c. to 50c. on sheet clippings, machine shop turnings, heavy melting steel, and carwheels. Sales have been in small tonnages but more numerous. Several melters are in the market this week, some for heavy tonnages. The prices that they will pay depend to a large extent on what the railroads obtain for their current offerings.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel	$11.00 to $11.50
Scrap rails for melting	10.75 to 11.25
Loose sheet clippings	8.50 to 9.00
Bundled sheets	9.00 to 9.50
Cast iron borings	8.00 to 8.25
Machine shop turnings	7.50 to 8.00
No. 1 busheling	10.00 to 10.50
No. 2 busheling	6.00 to 6.50
Rails for rolling	12.50 to 13.00
No. 1 locomotive tires	12.75 to 13.25
No. 2 railroad wrought	11.00 to 11.50
Short rails	15.75 to 16.25
Cast iron carwheels	11.00 to 11.50
No. 1 machinery cast	15.00 to 15.50
No. 1 railroad cast	12.75 to 13.25
Burnt cast	7.50 to 8.00
Stove plate	8.25 to 8.75
Brake shoes	9.50 to 10.25
Railroad malleable	11.50 to 12.00
Agricultural malleable	10.50 to 11.00

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and struc. shapes	3.40c.
Bars, soft steel or iron	3.30c.
New billet reinforc. bars	3.15c.
Rail steel reinforc. bars	3.00c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-fin. rounds and hex	3.85c.
Squares	4.35c.
Black sheets (No. 24)	3.90c.
Galvanized sheets (No. 24)	4.75c.
Blue ann'l'd sheets (No. 10)	3.45c.
Structural rivets	3.85c.
Small rivets	65 per cent off list
No. 9 ann'l'd wire, per 100 lb	$3.00
Com. wire nails, base per keg	2.95
Cement c't'd nails, base 100 lb. keg	2.95
Chain, per 100 lb	7.55
	Net per 100 Ft.
Lap-weld. steel boiler tubes, 2-in.	$18.00
4-in.	38.00
Seamless steel boiler tubes, 2-in.	19.00
4-in.	39.00

Detroit

Some Slackening in Automobile Production But Rate Is Ahead of That in 1927

DETROIT, Aug. 14.—There has been some slackening in automotive production, but the present volume is still running ahead of that of 1927.

The Buick Motor Co. produced 15,000 cars last month and is running now at approximately 900 a day. The Chevrolet company turned out approximately 120,000 cars and trucks during July, which sets a new July record for the company's production. Only 87,134 units were produced in the same month of 1927. July figures, however, are approximately 13,000 units short of June production.

To date, approximately 200,000 model A units have been produced by the Ford Motor Co. Production schedules are steadily advancing, with a daily output at present of approximately 3000 units. By September, it is expected, the company will be able to increase the rate of progress substantially and for the coming year production may exceed 10,000 units a day. All of the 36 domestic assembly plants of the Ford company are now in operation and payrolls are at the highest level in the history of the company.

Extensive additions are being begun at the Graham-Paige plants, including the one in Detroit, the one at Wayne, Mich., and also the Evansville unit. The new buildings and equipment will increase capacity from 400 to 600 cars a day, and will necessitate an expenditure of approximately $1,500,000.

The Packard Motor Car Co. shipped 3805 cars in July, compared with 3080 in July last year. The August schedule is set for 4800 units.

The July record for the sale of Studebaker cars stands at 12,600 units, 400 units under June and 3867 units in advance of July, 1927.

The Willys-Overland Co. up to July 15 showed sales of approximately 215,000 units. Sales for all of 1927 were only 171,743.

Old Material. — There has been considerable activity in the scrap market in this district, with several large inquiries pending for delivery to Ohio mills. Advances of 25 to 50c. per ton have been recorded.

Dealers' buying prices per gross ton f.o.b. cars, Detroit:

Hvy. melting and shov. steel	$11.50 to $12.00
Borings and short turnings	7.25 to 7.75
Long turnings	5.75 to 6.25
No. 1 machinery cast	14.00 to 15.00
Automobile cast	19.00 to 20.50
Hydraul. comp. sheets	10.00 to 10.50
Stove plate	11.00 to 12.00
No. 1 busheling	8.75 to 9.25
Sheet clippings	6.50 to 7.00
Flashings	9.50 to 10.00

Buffalo

Heavy Steel Scrap Advances $1 a Ton—Active Buying of Pig Iron

BUFFALO, Aug. 14.—Pig iron producers have been booking considerable tonnage, and inquiry has held up well. The lots sought are mostly of moderate size, but there have been some sizable inquiries also. The General Electric Co. is in the market for 5000 tons of foundry and malleable grades for its various plants, and a New England interest wants 4000 tons of foundry. The Kennedy Valve Mfg. Co., Elmira, N. Y., is inquiring for 300 to 500 tons of foundry and malleable. The Massey-Harris Harvester Co., Inc., has purchased 4000 tons of foundry and malleable for Batavia, N. Y., and Canada, the larger portion of the tonnage going to Batavia. Other lots placed include one of 600 tons of foundry; another of 500 tons of malleable and a third of 300 tons of malleable. On business in this district the market is firmly held at $17, furnace, for No. 2 plain foundry and on malleable with silicon up to 2.75 per cent. One interest announces that it will waive no differentials on Eastern business and that it will adhere to a minimum of $16.50, Buffalo base, on such shipments.

Prices per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	$17.00
No. 2X fdy., sil. 2.25 to 2.75	17.50
No. 1X fdy., sil. 2.75 to 3.25	18.50
Malleable, sil. up to 2.25	17.50
Basic	$16.50 to 17.00
Lake Superior charcoal	27.28

Finished Steel.—Mill operations have again increased, now averaging close to 90 per cent of capacity. Prices on bars, shapes and plates are being firmly held, and specifications are in good volume. Black sheets are firm at 2.65c., base Pittsburgh, quotations as low as 2.60c. having practically disappeared. Galvanized sheets are 3.50c. to 3.55c., and automobile body sheets, 4c., base Pittsburgh. Strip steel is active, with shipping orders heavy. There is a feeling in the trade that higher strip prices will develop. Pipe specifications are satisfactory. Reinforcing bar awards are small in volume, although numerous.

Old Material.—Sharp competition for the available heavy melting steel drove prices up $1 a ton this week, and further advances are expected. One purchase of a couple of thousand tons was made at $14.50, but an offer of $15 failed to pull out a tonnage. It was reported, though not verified, that one of the larger consumers had meanwhile bought a tonnage at $14.75. Most other grades remain quiet.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$14.50 to $15.00
No. 2 heavy melting steel	13.00 to 13.25
Scrap rails	13.00 to 13.50
Hydraulic comp. sheets	13.00 to 13.25
Hand bundled sheets	8.00 to 8.50
Drop forge flashings	12.00 to 12.50
No. 1 busheling	13.00 to 13.25
Hvy. steel axle turnings	12.00 to 12.50
Machine shop turnings	7.00 to 7.50
No. 1 railroad wrought	11.00 to 11.50
Acid Open-Hearth Grades	
R'lr'd knuckles and couplers	15.00
R'lr'd coil and leaf springs	15.00 to 16.00
Rolled steel wheels	15.00
Low phos. billet and bloom ends	16.00 to 16.50
Electric Furnace Grades	
Hvy. steel axle turnings	12.00 to 12.50
Short shov. steel turnings	9.00 to 9.50
Blast Furnace Grades	
Short shov. steel turnings	9.00 to 9.50
Short mixed borings and turnings	9.00 to 9.50
Cast iron borings	9.00 to 9.50
No. 2 busheling	9.00 to 9.25
Rolling Mill Grades	
Steel car axles	15.50 to 16.00
Iron axles	19.50 to 20.00
Cupola Grades	
No. 1 machinery cast	14.25 to 14.75
Stove plate	13.00 to 13.25
Locomotive grate bars	11.25 to 11.75
Steel rails, 3 ft. and under	16.00 to 16.50
Cast iron carwheels	12.00 to 12.50
Malleable Grades	
Industrial	14.50
Railroad	14.50
Agricultural	14.50

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struct. shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.75c.
Cold-fin. flats, sq. and hex	4.45c.
Rounds	3.95c.
Cold-rolled strip steel	5.85c.
Black sheets (No. 24)	4.20c.
Galv. sheets (No. 24)	4.70c. to 5.05c.
Blue ann'l'd sheets (No. 10)	3.70c.
Com. wire nails, base per keg	$3.65
Black wire, base per 100 lb	3.90

Youngstown

Sheet & Tube Company Advances Sheets for Fourth Quarter

YOUNGSTOWN, Aug. 14.—Fourth quarter sheet prices have been advanced an average of $2 per ton by the Youngstown Sheet & Tube Co., and there are indications that other light steel products, such as strips, will also be marked up. The company also advises that, effective Oct. 1, its regular terms of payment on sheets will be changed to read: "Net cash within 30 days, or one-half of 1 per cent discount on f.o.b. mill value for payment within 10 days of date of invoice." This is in line with the policy recently adopted by other sheet manufacturers. In some cases, discounts up to 2 per cent for payment in 10 days have been allowed.

New prices quoted by the Sheet & Tube company are on a Pittsburgh base, with the usual differentials for Gary and Birmingham. The price schedule is: automobile body sheets, 4c. per lb., base; one-pass black sheets, 2.75c. per lb., base; galvanized sheets, 3.60c. per lb., base; blue annealed sheets, under 45 in. wide, 2c. per lb., base, and 2.10c. for 45 in. and wider.

Heavy mill operations rule this week, with 43 or 53 independent open-hearth furnaces active and sentiment in the industry optimistic. The trend of prices is upward, and it is believed that advances will be realized by the fourth quarter.

Consumption of pig iron is running ahead of production, as furnace yard stocks are being depleted and there is little accumulation to fall back upon. Fall demand is expected to bring a number of blast furnaces into action. The Sheet & Tube company this week started its Grace stack in the Brier Hill group and will later suspend for repairs the Jeannette furnace in the same complement.

Black sheet prices, which were recently down to 2.60c. and 2.65c. per lb., Pittsburgh, are now more frequently 2.75c., and mills are aiming at 2.80c. Firmness is evident in other rolled steel prices, and the tone of the pig iron market is better.

Of 127 sheet mills in the Mahoning Valley, 108 started this week, with four to be added, and 12 of 20 tube mills are under power.

Steel fabricators continue to operate at 90 per cent of capacity or better, The A. M. Byers Co., Pittsburgh, continues to run its Girard puddling department at 60 per cent and rolling mills at 80 per cent. The Newton Steel Co. is operating all of its 20 mills at Newton Falls, Ohio.

Republic Iron & Steel Co. Lowers Cash Discount

Following the lead of the American Rolling Mill Co., the Republic Iron & Steel Co. has announced that on all orders accepted for delivery on and after Oct. 1 next, the terms on sheets and long ternes will be one-half of 1 per cent in 10 days, 30 days net. Discount will be allowed only on the value of the material f.o.b. mill and not on freight to destination.

Equipment Wanted by Frankfort, Ohio

The village of Frankfort, Ohio, will receive bids until Aug. 22 on the following equipment: one Fairbanks-Morse type Y vertical engine No. 562916, 75 hp., 300 r.p.m.; one Fairbanks-Morse alternator, 3-phase, 60-cycle, 1150 volts; one Fairbanks-Morse compound wound generator No. X36422, frame 61, 5 kw., 1400 r.p.m.; one centrifugal water pump; two 400-lb. test air tanks; one Fairbanks-Morse 3 x 3½-in., No. 10494 air compressor; one 200-gal. emergency oil tank; one 10,000-gal. fuel oil tank; one complete switchboard, h.v. 1150, l.v. 110; one No. 26063 single-phase Bullock generator, amp. 77.2; r.p.m. 900, volts 1100; one direct-current Westinghouse generator No. 40, type S.K., 1480 r.p.m., serial No. 1881581; 20 size 3 transformers; eight size 5 transformers; two size 7 transformers; one lot of odd fittings. Bids are to be addressed to D. F. Briggs, Jr., president of the board of public affairs.

Non-Ferrous Metal Markets

Good Buying of Copper, Tin Prices Declining, Lead and Zinc Quiet and Steady

THE WEEK'S PRICES. CENTS PER POUND FOR EARLY DELIVERY

	Aug. 14	Aug. 13	Aug. 11	Aug. 10	Aug. 9	Aug. 8
Lake copper, New York	14.75	14.75	14.75	14.75	14.75	14.75
Electrolytic copper, N. Y.*	14.50	14.50	14.50	14.50	14.50	14.50
Straits tin, spot, N. Y.	48.25	48.25	....	48.87½	48.57½	48.10
Lead, New York	6.20	6.20	6.20	6.20	6.20	6.20
Lead, St. Louis	6.00	6.00	6.00	6.00	6.00	6.00
Zinc, New York	6.60	6.60	6.60	6.60	6.60	6.60
Zinc, St. Louis	6.25	6.25	6.25	6.25	6.25	6.25

*Refinery quotation; delivered price ¼c. higher.

Copper.—Buying of copper for September delivery by domestic consumers has been quite heavy the past week and it is estimated in the trade that they have covered for about two-thirds of their requirements for that month. Foreign buying has also been quite liberal, sales last week being placed at probably 7500 to 8000 tons. Some August delivery as well as September was included in the foreign sales, but considerable metal must still be bought for next month's delivery. Thus far this week the market has been quiet with prices continuing very firm at 14.75c., delivered in the Connecticut Valley, and at 14.87½c., in the Central West. Lake copper is moderately active at 14.75c. to 14.87½c., delivered. The official quotation of Copper Exporters, Inc., continues unchanged at 15c., c.i.f., usual European ports. Statistics for July show a decrease in stocks of refined metal of about 4000 tons. Domestic shipments of over 82,000 tons were among the highest on record. Export shipments were large at nearly 57,000 tons.

Tin.—That consumers, both large and small, are not covered very far ahead is indicated by recent developments. They have been buying quite heavily the last week of nearby metal and it is stated that they have much to buy yet for the remainder of the year. With the East selling freely, however, no scarcity is anticipated and there may even be an increase in the visible supply. With the tin plate industry very active and with automobile makers also running quite full, a large buying power is back of the market. Sales for last week were about 1200 tons, most of which was taken by consumers. Spot and August delivery, which is closely controlled and commands a good premium, was dealt in principally. Monday consumers took about 200 tons. Tuesday the market was very dull with spot Straits tin quoted at 48.25c., New York. Dealers are not at all active in the present market. Ar-

Metals from New York Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	50.00c. to 51.00c.
Tin, bar	52.00c. to 53.00c.
Copper, Lake	15.75c.
Copper, electrolytic	15.50c.
Copper, casting	14.75c.
Zinc, slab	7.25c. to 7.75c.
Lead, American pig	7.25c. to 7.75c.
Lead, bar	9.25c. to 10.25c.
Antimony, Asiatic	12.50c. to 13.00c.
Aluminum No. 1 ingots for remelting (guar'nt'd over 99% pure)	25.00c. to 26.00c.
Alum. ingots, No. 12 alloy	24.00c. to 25.00c.
Babbitt metal, commerc'l grade,	30.00c. to 40.00c.
Solder, ½ and ½	32.50c. to 33.50c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	54.50c.
Tin, bar	58.50c.
Copper, Lake	14.85c.
Copper, electrolytic	14.85c.
Copper, casting	14.00c.
Zinc, slab	8.00c.
Lead, American pig	6.75c. to 7.00c.
Antimony, Asiatic	16.00c.
Lead, bar	9.50c.
Babbitt metal, medium grade	18.50c.
Babbitt metal, high grade	58.00c.
Solder, ½ and ½	32.00c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	19.25c.
Copper, hot rolled	24.00c.
Copper, cold rolled, 14 oz. and heavier	25.75c.
Seamless Tubes—	
Brass	24.12½c.
Copper	25.00c.
Brazed Brass Tubes	27.25c.
Brass Rods	17.00c.

From New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks	10.00c. to 10.50c.
Zinc sheets, open	11.00c. to 11.50c.

Non-Ferrous Rolled Products

Mill prices on bronze, brass and copper products are holding at the same levels that have prevailed for nearly three months. Zinc sheets are quoted at 9.75c., base, and lead full sheets at 10c. to 10.25c.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	19.25c.
Copper, hot rolled	23.50c.
Zinc	9.75c.
Lead (full sheets)	10.00c. to 10.25c.
Seamless Tubes—	
High brass	24.12½c.
Copper	25.00c.
Rods—	
High brass	17.00c.
Naval brass	19.75c.
Wire—	
Copper	16.75c.
High brass	19.75c.
Copper in Rolls	22.50c.
Brazed Brass Tubing	27.25c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also to St. Louis on shipments to points west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	33.00c.
Tubes, base	42.00c.
Machine rods	34.00c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged customers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	12.625c.	14.00c.
Copper, hvy. and wire	12.50c.	13.50c.
Copper, light and bottoms	10.75c.	12.00c.
Brass, heavy	7.00c.	8.25c.
Brass, light	6.00c.	7.50c.
Hvy. machine composition	9.75c.	10.75c.
No. 1 yel. brass turnings	8.75c.	9.50c.
No. 1 red brass or compos. t'ings	9.00c.	10.00c.
Lead, heavy	5.00c.	5.375c.
Lead, tea	3.75c.	4.25c.
Zinc	3.00c.	3.50c.
Sheet aluminum	12.50c.	14.50c.
Cast aluminum	11.75c.	13.50c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Consumers' Doors in City Limits)

Sheets—	Base per Lb.
High brass	19.25c.
Copper, hot rolled	23.50c.
Copper, cold rolled, 14 oz. and heavier	25.75c.
Zinc	10.00c.
Lead, wide	9.75c.
Seamless Tubes—	
Brass	25.62½c.
Copper	26.50c.
Brazed Brass Tubes	27.25c.
Brass Rods	17.00c.

rivals thus far this month have been 2175 tons, with 7620 tons reported afloat.

Lead.—Quotations have been advancing in London, but thus far without any particular effect on this market. Prices here are firm and unchanged at 6c., St. Louis, and at 6.20c., New York, the latter being the quotation of the leading interest. Sales have been confined largely to carload and small lots for spot and August delivery, although one day last week a fair business was done in September delivery, interest in which is accumulating, some sales being made each day. Thus far producers have not been selling October delivery.

Zinc.—Consumer buying has been in fairly large volume the past week, but the feature has been the firmness of prices which continue unchanged at 6.25c., East St. Louis, or 6.60c., New York. Open inquiry has not been large, but considerable business has been done very quietly. In general the market has been featureless. In Saturday's Joplin market, ore prices were unchanged at $40 a ton, which has prevailed since some time in May. Sales of ore for the week were about 9690 tons, with the output 12,500 tons, and with the week's shipments about 11,250 tons, leaving stocks on Aug. 11 at about 36,450 tons. This compares with about 50,000 tons on Jan. 1. Consuming inquiry Monday and Tuesday was only moderate.

Antimony.—Chinese metal for spot delivery is quoted at 10c. to 10.25c., New York, duty paid, with futures bringing a slight premium.

Nickel.—Quotations are unchanged with ingot nickel at 35c., with shot nickel at 36c. and with electrolytic nickel at 37c. per lb. in wholesale lots.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is unchanged at 23.90c., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, Aug. 14.—Individual sales are small but the aggregate tonnage is of fair size. Prompt delivery is expected by buyers. The old metal market is without feature.

Prices, per lb., in carload lots: Lake copper, 15.25c.; tin, 49.50c.; lead, 6.10c.; zinc, 6.35c.; in less-than-carload lots, antimony, 11c. On old metals we quote copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 9.75c.; red brass, 9.50c.; yellow brass, 7.25c.; lead pipe, 4.75c.; zinc, 3.50c.; pewter, No. 1, 30c.; tin foil 36.25c.; block tin, 45.25c.; aluminum, 12c.; all being dealers' prices for less-than-carload lots.

Fabricated Structural Steel

Additional New York Subway Work Calls for 29,000 Tons—Awards of Only 25,000 Tons

STRUCTURAL awards of 25,000 tons were less than half the average of recent weeks and included no sizable projects except a section of the New York subway requiring 4000 tons. The 37,250 tons called for in new projects was made up largely of three sections of the New York subway, requiring 29,000 tons, and a department store building in Brooklyn, which will take 6000 tons. Awards follow:

WORCESTER, MASS., 1600 tons, telephone building, to New England Structural Co.

QUINCY, MASS., 410 tons, stores and offices, to Palmer Steel Co.

NEW YORK, 4000 tons, section 1-A, route 8, of New York subway; from D. C. Serber, Inc., to Bethlehem Steel Co.

NEW YORK, 700 tons, column cores for Lehigh Valley warehouse at 144th Street and Girard Avenue, to Levering & Garrigues Co.

BROOKLYN, 600 tons, sheet piling for new subway, to Jones & Laughlin Steel Corporation.

OLEAN, N. Y., 250 tons, East State Street bridge, to McClintic-Marshall Co.

CATSKILL, N. Y., 110 tons, highway bridge, to American Bridge Co.

ADAMS STATION, N. J., 400 tons, highway bridge, to Phoenix Bridge Co.

TRENTON, N. J., 700 tons, second unit of State office building, to American Bridge Co.

PHILADELPHIA 800 tons, service elevators for Strawbridge & Clothier department store, to Bethlehem Steel Co.

BETHESDA, MD., 100 tons, highway bridge, to American Bridge Co.

COVINGTON, VA., 1500 tons, factory building for Industrial Rayon Co., to Virginia Bridge & Iron Co.

PENNSYLVANIA RAILROAD, 200 tons, two bridges in Ohio, to American Bridge Co.

ERIE RAILROAD, 425 tons, bridge at Youngstown, Ohio, to Jones & Laughlin Steel Corporation.

CLAIRTON, PA., 300 tons, two oil tanks for Carnegie Steel Co., to Riter-Conley Co.

PITTSBURGH, 2800 tons, 18 river barges for Union Barge Line Corporation, to American Bridge Co. and Dravo Contracting Co.; each nine barges and 1400 tons.

MEADVILLE, PA., 110 tons, Arter Hall, Allegheny College, to John Eichleay, Jr., Co.

YOUNGSTOWN, 180 tons, highway bridge, to Pittsburgh-Des Moines Steel Co.

VERMILION, OHIO, 130 tons, bridge for Ohio State Highway Department, to Fort Pitt Bridge Works.

BELLE, W. VA., 650 tons, 750,000-cu. ft. gas holder, to Stacey Mfg. Co.

LOUISVILLE, 1200 tons, warehouse, for Henry Vogt Co., to McClintic-Marshall Co.

STATE OF MICHIGAN, 170 tons, State highway bridge, to Massillon Bridge & Structural Co.

PITTSBURG, IND., 1100 tons, bridge across White River, to Vincennes Bridge Co.

MARSEILLES, ILL., 700 tons, bridge, to Mount Vernon Bridge Co.

CHICAGO, 500 tons, Goldberg Building, to McClintic-Marshall Co.

GREAT FALLS, MONT., 650 tons, high school, to Minnesota Steel & Machinery Co.

INDEX, WASH., 203 tons, bridge for Wallace Falls Timber Co., to Wallace Bridge & Structural Steel Co.

TACOMA, WASH., 350 tons, electric-chemical plant, to Star Iron & Steel Works.

MARE ISLAND, CAL., 149 tons sheet piling for Government, to an unnamed interest.

MARE ISLAND, 131 tons plates for Government, to unnamed interest.

TEXAS AND PACIFIC RAILROAD, 4200 tons for bridge work, to an unnamed fabricator.

PALO ALTO, CAL., 166 tons, telephone building, to Judson-Pacific Co.

SACRAMENTO, CAL., 455 tons, bridge at Saugus, Cal., to Claude Fisher, Los Angeles.

SACRAMENTO, 140 tons, bridge at Sargent, Cal., to McClintic-Marshall Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

BOSTON, 200 tons, city bridge on River Street.

NEW YORK, 29,000 tons, subway work; 6000 tons in section 2, route 106, bids Aug. 21; 20,000 tons in section 5, route 107, bids Aug. 31, and 3000 tons in section 5-B, route 109, bids Aug. 28.

BROOKLYN, 6000 tons, store building for Abraham & Straus.

ATLANTIC CITY, N. J., 350 tons, garage for Chalfonte-Haddon Hall.

LANSDOWNE, PA., 1000 tons, apartment building; Graham-Chambley Co., Philadelphia, general contractor.

MANSFIELD, OHIO, 200 tons, Hocking bank building.

DENVER, COLO., 103 tons plates for 36-in. pipe for Belle Fourche project in South Dakota for United States Bureau of Reclamation; Western Pipe & Steel Co., San Francisco, low bidder.

SAN MATEO, CAL., 170 tons, apartment building; bids being taken.

OAKLAND, CAL., 250 tons, hangar No. 4 for Port Commission; bids Aug. 13.

MAUPIN, ORE., 170 tons, bridge over Deschutes River; bids Aug. 14.

Record July Building in 37 Eastern States

July construction contracts in the territory east of the Rocky Mountains reached a total of $583,432,400, according to F. W. Dodge Corporation. The area covered in this record consists of 37 States and includes about 91 per cent of the total country. The above figure was the highest July contract total on record. It was 9 per cent ahead of the total for the same month of last year, but there was a drop of 10 per cent from the total for June of this year.

Last month's record brought the total amount of new building and engineering work started since the first of this year up to $4,028,299,900, establishing a new high record for new construction contracted for during the first seven months. The increase over the first seven months of 1927 was 8 per cent.

New work contemplated in the 37 States during the past month reached a total of $647,682,700, being a loss of 37 per cent from the amount reported in the preceding month and a drop of 7 per cent from the amount reported in July of last year.

PERSONAL

H. B. DEMPSEY and COMMANDER H. T. DYER have formed the Dempsey Furnace Co., Inc., 110 East Forty-second Street, New York, to design, manufacture and erect industrial furnaces formerly produced by the old Dempsey Furnace Co., which since August, 1925, has been operated as the Dempsey Furnace Division of the W. N. Best Corporation. All assets of the old company have been acquired and Mr. Dempsey will be president of the new company and Mr. Dyer, vice-president. The latter was formerly chief engineer of the Peabody Engineering Corporation.

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H. M. CLYMER has been elected vice-president of the Lebanon Iron Co., Lebanon, Pa.

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ALEXANDER GUTTMAN, New York, has been appointed chairman of a committee of common stcokholders of the Wickwire Spencer Steel Co., Inc., formed to protect their investment.

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M. M. HEDGES has been named president of the Hedges-Walsh-Weidner Boiler Co., Chattanooga, Tenn., formed recently by a merger of the Casey-Hedges Co. and the Walsh & Weidner Boiler Co.

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WILLIAM HARRIS, East Bridgewater, Mass., recently was made superintendent of the Government foundry in the Panama Canal Zone.

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GIFFORD K. SIMONDS, general manager of the Simonds Saw & Steel Co., Fitchburg, Mass., has been made a director of the International Paper Co.

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F. H. MOVIEL has resigned as manager of the machinery division of the American Foundry Equipment Co., Mishawaka, Ind.

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H. C. PETERSON, recently associated with the Underwriters' Laboratories, Chicago, has been made engineer for the Bundy Tubing Co., Detroit, according to an announcement by H. W. BUNDY, president of the company.

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PAUL A. IVY, until recently associated with the American Cast Iron Pipe Co., Birmingham, has been elected vice-president of the National Cast Iron Pipe Co., of the same city. E. E. LINTHICUM continues as president of the National company. A. P. FINCK, who has been works manager, has been named general manager; W. H. SAUNDERS, assistant general manager, and A. M. FORD, chief engineer.

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JOHN H. BODE has resigned as president and general manager of the Wellman-Seaver-Morgan Co., Cleveland, and has been succeeded by GEORGE W. BURRELL, formerly vice-president, who retired two years ago to take a rest after 27 years' affiliation with the company. Mr. Bode had been with the company about two years.

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GEORGE D. BRANSTON has resigned as manager of railroad material sales for the Jones & Laughlin Steel Corporation, Pittsburgh, to become associated, Sept. 1, with the Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich., as comptroller and director. Prior to his connection with Jones & Laughlin corporation, Mr. Branston was for several years secretary and treasurer of Manning, Maxwell & Moore, Inc., New York.

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FRANK F. CORBY, formerly vice-president in charge of sales for the Steel & Tube Co. of America, and more recently Pacific Coast representative for the A. M. Byers Co., has become associated with the Jones & Laughlin Steel Corporation as special Pacific Coast representative.

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W. ROY MOORE has been appointed sales manager of an office which has been opened at room 1205, 71 Murray Street, New York, by the Billings & Spencer Co., Hartford, Conn., to serve the metropolitan New York and Philadelphia territories. ROBERT C. SMITH will be associated with Mr. Moore and will have charge of export sales.

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ALBERT E. GROVER has been appointed cost consultant for the National Machine Tool Builders' Association and will begin work immediately in his new association. He has had many years of experience as cost accountant and comptroller of business houses and is a charter member of the Cleveland chapter of the National Association of Cost Accountants having served as president of the chapter in 1926 and 1927. Since 1923 he has been engaged in the installing of cost systems on his own account.

Obituary

C. KEMBLE BALDWIN, vice-president of the Robins Conveying Belt Co., New York, died in Los Angeles on Aug. 9, after a lingering illness. He was born at Philadelphia in 1873 and was graduated from Lehigh University in 1895.

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HARRY E. HIGGINS, formerly vice-president of the Otis Steel Co., Cleveland, was instantly killed in an airplane accident at Palo Alto, Cal., Aug. 11. He had severed his connection with the Otis company several years ago and last year disposed of other business interests in Cleveland and moved to California.

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JAMES B. LAUGHLIN, director and member of the executive committee Jones & Laughlin Steel Corporation, and its treasurer from 1904 to 1910, died at his summer home in Hyannis Port, Mass., Aug. 12. He was a grandson of James Laughlin, one of the founders of the Jones & Laughlin corporation, and was born in Pittsburgh 63 years ago. Following his graduation from Princeton University in 1886 he joined the Jones & Laughlin company, and was superintendent of the Eliza furnaces from 1894 to 1900.

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CAPT. WARREN ELSEY, formerly transportation master of the Vesta Coal Co. subsidiary of the Jones & Laughlin Steel Corporation, Pittsburgh, died at his home in Philadelphia, Aug. 11. He had been identified almost continuously with river transportation activities of the Jones & Laughlin organization from 1864 until his retirement about three years ago. He was born near Portsmouth, Ohio, in 1848. A son, P. C. Elsey, now is transportation master for the Vesta Coal Co., and another, Warren Elsey, Jr., is assistant superintendent of the Central Iron & Steel Co., Harrisburg, Pa.

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SETH BARHAM, assistant treasurer of the American Radiator Co., New York, died on Aug. 13, after a lingering illness. He was also vice-president of the Humphreys Coal & Coke Co., Greensburg, Pa., and the Tonawanda Iron Corporation, North Tonawanda, N. Y., subsidiaries of the Radiator Company, and had been identified with that organization for many years.

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JOSEPH D. BASCOM, chairman of the board and one of the founders of the Broderick & Bascom Rope Co., St. Louis, died recently at his home in that city. He was 78 years of age and was born and had lived his entire life in St. Louis. In 1878, with John J. Broderick, he founded the firm of which he was head at the time of his death.

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ALONZO C. PACKER, general inspector H. K. Porter Co., Pittsburgh, and inventor of the Packer locomotive truck, now in general use on American railroads, died at St. Francis Hospital, Pittsburgh, Aug. 6. He was born in Strattanville, Pa., April 29, 1852, and had been identified with the Porter company for 57 years.

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FRANK W. GOODRICH, for 20 years plant superintendent for the Graton & Knight Co., Worcester, Mass., died on Aug. 10 at his home in that city, aged 56 years. He had been identified with the company for 40 years.

REINFORCING STEEL

AWARDS of 4400 tons reported during the last week include no jobs of outstanding size. Included in the 3500 tons called for by new projects are 1000 tons for a loft building in New York and a similar tonnage for three sections of the subway in the same city. Awards follow:

NORWALK, CONN., 400 tons, factory building for Sunfast Hat Co., to National Bridge Works, Inc.

WHITE PLAINS, N. Y., 500 tons, high school, to Ferro Building Products Co.

NEW YORK, 300 tons, sewer work in Queens; from Necaro Construction Co., general contractor, to Concrete Steel Co.

NEW YORK, 250 tons, subway section 1-A, route 8; from D. C. Serber, Inc., general contractor, to Igoe Brothers.

NEW YORK, 100 tons, Seward Park High School, to Carroll-McCreary Co., Inc.

NEW YORK, 100 tons, Queens Vocational School, to Tidewater Structural Materials Corporation.

NEWARK, N. J., 110 tons, First Avenue public school, to Tidewater Structural Materials Corporation.

BUFFALO, 100 tons, Bird Island pier, to a Buffalo maker.

CHICAGO, 160 tons, Palmolive-Peet Building, to Kalman Steel Co.

CHICAGO, 220 tons, Belmont Bank Building, to Truscon Steel Co.

CHICAGO, 160 tons, Victor Mfg. & Gasket Co., to an unnamed bidder.

CHICAGO, 120 tons, alterations to Olympic Theatre, to Duffin Iron Co., local.

CHICAGO, 175 tons of rail steel bars, Twelfth Street store, to an unnamed bidder.

EAST CHICAGO, IND., 200 tons of rail steel bars, bank building, to Barton Spiderweb System, Inc.

STATE OF ILLINOIS, 200 tons of rail steel bars, road work, to Olney J. Dean & Co

LOS ANGELES, 589 tons, Big Dalton Dam, to Pacific Coast Steel Co.

CULVER CITY, CAL., 459 tons, storm drain, to Braun, Bryant & Austin.

VERNON, CAL., 181 tons, bridge over Los Angeles River at Soto Street, to Pozzo Construction Co.

OAKLAND, CAL., 104 tons, bridge over Niles Canyon, to Pacific Coast Steel Co.

SACRAMENTO, CAL., 147 tons, bridge at Saugus, Cal., to Barrett & Hilp, San Francisco.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

NEW YORK, 1000 tons, loft building for B. B. Davis at Hudson, Dominick and Broome Streets.

NEW YORK, unstated tonnage, miscellaneous work in Mott Haven yard of New York, New Haven & Hartford Railroad.

NEW YORK, 1000 tons, three sections of subway; 300 tons in section 1, route 108, Triest Contracting Corporation, low bidder; 400 tons in section 2, route 106, bids Aug. 21, and 300 tons in section 5, route 107, bids Aug. 24.

STATE OF NEW JERSEY, 250 tons, highway work; 150 tons on route 25, bids Aug. 20, and 100 tons on route 17, bids in.

KEARNY, N. J., 300 tons, factory buildings Nos. 51 and 52 for Western Electric Co., Inc.; Austin Co., Philadelphia, general contractor.

CHICAGO, 120 tons, garage at Twenty-sixth Street and Michigan Boulevard.

CHICAGO, 150 tons, garage for Swift & Co.

CHICAGO, 315 tons, Judah Studio; Holabird & Root, architects.

MAUPIN, ORE., 160 tons, bridge over Deschutes River; bids Aug. 14.

LOS ANGELES, 500 tons, office building, Hollywood and Vine Streets; bids soon.

Notable Activity in New England

Reflecting the betterment in the small tool business, the Greenfield Tap & Die Corporation, Greenfield, Mass., during the first six months of this year did more business than in the corresponding period last year. The average of customers' orders was at the highest point since 1920. Furthermore, indications are the last six months of 1928 will exceed 1927 in volume and value.

The Standard Screw Co., Hartford, Conn., reports production and new orders running decidedly ahead of the same period last year, with first-half sales quite satisfactory.

The Geometric Tool Co., New Haven, Conn., reports no change in prices, but any movement would be upward. The plant is operating practically full and its stock of raw and finished materials is lower than at any time during the past 10 years. Sales through offices in New York, Philadelphia, Baltimore, Pittsburgh and Cincinnati are less than a year ago; those in northern territories, including Chicago, Indianapolis, Detroit, Toledo, Cleveland and upper New York State are far ahead of last year, while in New England they are just about holding their own. The West is below last year. In contrast, the export business is on the upturn and looks encouraging.

The Pratt & Whitney Co., Hartford, Conn., during the first half of 1928 ran its plant at capacity, with a day and night shift in some departments. Sales were considerably ahead of last year for the corresponding period. The company has sufficient business already booked and future business practically assured to warrant the statement that the plant will be operated full during the remainder of 1928 and into the first quarter of 1929. In addition to an excellent domestic business, the firm is well booked up on foreign orders.

Continued High Activity in Automobiles

Production of passenger cars and trucks in July in the United States and Canada, according to *Automotive Industries*, slightly exceeded 400,000, bringing the total for the first seven months to about 2,725,000. Production in July last year was 279,456 and the first seven months 2,475,150. In 1926, the industry's record year, July output amounted to 374,483 and the first seven months to 2,857,936. Production in August is running about 25 per cent higher than in the same month last year, a rate that unquestionably will be continued through the month. Factories which have recently introduced new models are in several instances more than a month behind on deliveries and increasing operations during the month will serve only to reduce the number of orders carried into September. The Ford company, now building about 4000 cars daily, is still several months behind orders.

British Iron and Steel Output Lower in July

LONDON, ENGLAND, Aug. 13 (*By Cable*).—Pig iron production in July was. 537,800 gross tons, and that of steel ingots and steel castings was 666,900 tons. Both show a decrease from the June totals.

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A comparison of the July output with that of the six preceding months of the year, and with the monthly rate for previous years is as follows, in gross tons:

	Pig Iron, Tons	Steel Ingots and Castings, Tons
1913—Av. monthly..	855,000	638,600
1920—Av. monthly..	669,500	755,600
1922—Av. monthly..	408,500	490,100
1923—Av. monthly..	620,000	706,800
1924—Av. monthly..	609,900	685,100
1925—Av. monthly..	519,700	616,400
1926—Av. monthly..	203,500	296.700
1927—Av. monthly..	607,800	758,200
1928—January	560,600	626,200
1928—February	550,800	764,400
1928—March	592,600	793,300
1928—April	555,000	644,100
1928—May	591,500	752,700
1928—June	563,700	709,500
1928—July	537,800	666,900

Stack to Go Out After Operating Nine Years

After continuous operation for nearly nine years, during which it has produced over 1,835,000 tons of pig iron, breaking, it is believed, all blast furnace operation and production records, "A" stack of the Toledo Furnace Co., Toledo, Ohio, operated by Pickands, Mather & Co., Cleveland, will be blown out next week. This furnace, after being rebuilt, went in blast Nov. 6, 1919, and it has not been cold since that date, having undergone only a few minor repairs such as patching the lining at the stock line. The lining at present is in good condition and, it is believed, would last a year or two longer, but most of the furnace equipment is literally worn out. For the past year the furnace has had a daily output of approximately 625 tons, or more than it produced when it was first built. The furnace will be relined, the hearth enlarged from 18 ft. to 19 ft. 6 in., and a new electric hoisting engine will be installed to replace the present steam engine.

Railroad Equipment

Missouri Pacific has ordered 100 automobile cars from American Car & Foundry Co.

Erie Railroad is inquiring for five 120-ton, depressed center flat cars.

Machinery Markets and News of the Works

Good Year for Machine Tools

Business in First Seven Months About Equal to That in 1919, the Industry's Record Post-War Year

MACHINE tool business in the first seven months of 1928 was about equal to that in the first half of 1919, the industry's best post-war year, and is more than double the average of the corresponding number of months in 1922, 1923 or 1924, according to the monthly report of the National Machine Tool Builders' Association.

Figures compiled by the association on July orders and shipments show a slight dip downward for that month. The report says that "the present slacking off may be seasonal, as all indicators point to a continued good volume of orders, and the August reports may again show an upturn over June and July."

Shipments of machine tools in July reflected the vacation season, dropping about 6 per cent below those in June, but this helped to lift the volume of unfilled orders at the end of July to a figure approximately twice that of the orders received during the month.

The outlook for the machine tool industry is regarded as satisfactory, and comment is made by the association that the coming political campaign has not thus far disturbed business.

"General business ought gradually to be stimulated by the usual fall activity," says the report. "From August on it appears that we ought to have a good fall business in the machine tool line. The only possible dampening influence would be the effect of excessive speculation on the purchasing power of machine tool users. That, however, is not likely to be extremely serious and is a possibility rather than a probability.

"The business prospects of nearly all industries using machine tools are quite good. The oil producers, the shipyards and the railroad equipment concerns are the only tool buying groups whose present prospects can be classed as poor—and these groups are a relatively small proportion of our industry's customers."

August has brought a continued steady demand in nearly all market centers. The demand comes from a wide circle of manufacturing companies. Absences of executives on vacation this month have caused some delays in the placing of orders for equipment quoted on, but the volume of inquiry indicates that plans are under way for an upswing in buying activities in the early fall.

New York

NEW YORK, Aug. 14.—Machine tool buying in the first two weeks of August has proceeded at a steady rate, and while orders may not equal the exceptional totals of June and July, the outlook continues very promising. A good many executives of manufacturing plants are away on vacation this month, a situation which tends to delay the placing of orders on which quotations have been submitted, but the number of inquiries being received indicates that many manufacturers expect a continued high rate of manufacturing activities in the fall.

Russell, Burdsall & Ward Co., Port Chester, N. Y., has awarded general contract to Austin Co. for two-story addition to branch plant at Sterling, Ill., 65 x 160 ft., reported to cost upward of $70,000 with equipment. Company is reported considering another addition in same plant.

Packard Motor Car Co. of New York, Broadway and Sixty-first Street, will take bids in September for new multi-story service, repair and garage building at 773-87 Eleventh Avenue, to cost more than $1,500,000 with equipment. It is purposed to remove present mechanical plant at Long Island City to new location and provide additional capacity. Albert Kahn, Marquette Building, Detroit, and E. S. Parker, 119 West Fifty-seventh Street, New York, are architects.

R. H. Macy & Co., Thirty-fourth Street and Broadway, New York, have acquired property, 325 x 340 ft., at Newark, as site for multi-story storage and distributing plant, to include installation of mechanical-handling equipment, etc. Project is reported to cost more than $200,000.

Shampan & Shampan, 188 Montague Street, Brooklyn, architects, have filed plans for a two-story automobile service, repair and garage building; 89 x 180 ft., at Long Island City, to cost about $180,000 with equipment; also for a similar two-story building, 100 x 277 ft., in Bronx, to cost more than $200,000 with equipment.

Board of Education, Elmont, N. Y., is said to be planning installation of manual training equipment in new high school to cost in excess of $750,000, for which bids will be asked in about 60 days on general contract. Knepper & Morris, 171 Madison Avenue, New York, are architects.

Central Foundry Co., 1434 Fulton Street, Brooklyn, has awarded general contract to P. M. Sterling, 33 West Forty-second Street, New York, for two-story branch storage and distributing plant at Forest Hills, L. I., to cost about $40,000. Bly & Hamann, 551 Nostrand Avenue, Brooklyn, are architects.

C. N. Shinston, 2 Columbus Circle, New York, architect, has plans for one and two-story automobile service, repair and garage building, 100 x 200 ft., to cost close to $100,000 with equipment.

National Air Transport, Inc., 420 Lexington Avenue, New York, is reported planning new air terminal at Dry Harbor, Middle Village, N. Y., including hangars, repair and reconditioning shops, oil storage and distributing building and other units.

Standard Oil Co. of New Jersey, 26 Broadway, New York, has authorized expansion at its refinery at Bayway, Elizabeth, N. J., to include extensions in gasoline refining division to increase output by 4000 bbl. per day, to cost about $1,500,000 with machinery.

Board of Education, New Milford, N. J., is considering installation of manual training equipment in new two-story and basement high school to cost $350,000, for which bids will be asked at once on general contract. Ernest Sibley, Bluff Road, Palisades, N. J., is architect.

Globe-Wernicke Corporation, Cincinnati, manufacturer of filing equipment, desks and kindred products, has purchased Steel Equipment Corporation, Avenel, N. J., manufacturer of metal business furniture, safes, etc., and will consolidate with its organization. Avenel plant will be developed as Eastern manufacturing and distributing works, and expansion is planned. Purchasing company is said to plan organization of new company under name of Business Service Bureau, to take over and merge both organizations.

Board of Education, Dunellen, N. J., is said to be planning installation of manual training equipment in new junior high school to cost in excess of $250,000, for which plans will be drawn by William Bragdon, 275 Morris Avenue, Elizabeth, N. J., and A. M. Korff, 203 Park Avenue, Plainfield, N. J., associated architects.

Eaton-Kent, Inc., 17 Academy Street, Newark, manufacturer of heating equipment and industrial apparatus, has leased a portion of former plant of Heller Brothers Co. and will equip for a machine shop and distributing service.

The Crane Market

THERE is very little new inquiry for locomotive or overhead traveling cranes, but sellers do not seem to expect much activity during the present midsummer season. Both in locomotive and overhead cranes there is some sizable export business pending from contracts being executed by American companies. In addition to the shop construction for the Turkish railroads, Fox Brothers International Co., New York, has contracts for the airway terminals of the new line to operate between Spain and Argentina. No action has been taken as yet by Dwight P. Robinson & Co., New York, on the locomotive cranes and steam shovels for export to a contract in Argentina. In overhead cranes, the General Electric Co., Schenectady, N. Y., is about to close on several small capacity low-headroom cranes.

Among recent purchasers are:

Passaic Valley Sewerage Commission, Passaic, N. J., 15-ton crawl-tread locomotive crane from McMyler-Interstate Co.

McClelland & Junkersfeld, engineers, 68 Trinity Place, New York, 100-ton, 63-ft. 6-in. span, 4-motor, overhead crane for Great Western Power Co., San Francisco, Cal., reported from Shaw Electric Crane Co.

Summers Fertilizer Co., Baltimore, Md., 5-ton, 80-ft. span, 4-motor, bucket handling crane from mid-western builder.

Globe Seamless Tubes Co., Milwaukee, 15-ton, 105-ft. span electric traveling crane, from unnamed bidder.

Sargent & Lundy, engineers, Chicago, 20-ton power house crane from Whiting Corporation.

Williams, White & Co., Moline, Ill., a 15-ton and a 30-ton electric crane, from Alfred Box & Co.

Bigbie Grate & Forced Draft Equipment Corporation, 90 West Street, New York, has been formed to make grates, blowers and heating equipment parts. Company is at present under contract to Hay Foundry & Iron Works, Newark.

Behr-Manning Corporation, Troy, N. Y., recently formed by consolidation of Herman Behr & Co., Brooklyn, and Manning Abrasive Co., Troy, has started construction of several buildings at Troy which will house machinery to be moved from Brooklyn plant, which will be discontinued. New buildings include machine shop, storehouse, manufacturing building, grading building, and power plant, with coal pocket, side tracks, etc. New construction will double capacity of plant and is estimated to cost $350,000. Morton C. Tuttle Co., Boston, is engineer and builder.

New England

BOSTON, Aug. 13.—The local machine tool trade has been more active the past week than in some time. The purchase of equipment by the city of Boston for its new Hyde Park district school is still under final adjustment, pending delivery dates and other matters, as stated before, purchases have been spread over a fairly large list of dealers, and it probably will be another week before full details are available.

In addition to this business, used tool dealers have closed on a comparatively good volume. One house sold 11 used presses, including one large and 10 small; another sold a set of rolls, a radial drill, several lathes and presses, and two single spindle drills, another sale included two fairly large lathes and a drill press. The 11 presses went to a Philadelphia dealer, but all other tools were taken by New England users.

George S. Wilber, 67 Redlands Road, West Roxbury district, Boston, is asking bids on a steel sand hopper at Newton, Mass.

E. P. Aldridge, 761 Dudley Street, Dorchester district, Boston, has completed plans for a one-story repair shop, 70 x 108 ft., for Frank Kerby, Summer Street, Natick, Mass.

Lynn Ornamental Iron Works, 966 Broad Street, Lynn, Mass., has awarded contract for a new shop. Sanborn & Weed, 38 Exchange Street, are architects.

Work has been started on a one-story plant, 42 x 70 ft., for Jewelers Cooperative Refining Co., Chestnut Street, North Attleboro, Mass., to replace one recently destroyed by fire.

M. S. Little Mfg. Co., 151 New Park Avenue, Hartford, Conn., manufacturer of plumbing equipment and supplies, has asked bids on general contract for one-story addition, 50 x 120 ft., with L extension 10 x 50 ft., to be equipped as a brass foundry. W. W. Dolliver, Hartford, is architect.

L. & M. Standard Parts Co., Boston, has leased property at 72 Brookline Avenue for a new shop.

Terkelsen Machine Co., 326 A Street, Cambridge, Mass., has asked bids on general contract for two-story addition, to cost close to $28,000 with equipment. F. E. Leland, 238 Main Street, is architect.

Olson Brothers, Camp Street, Plainville, Conn., manufacturers of screw machine products, have plans for a one-story addition, 26 x 85 ft.

Huntington Aircraft Corporation, Newfield Building, Bridgeport, Conn., has plans for new one-story plant, consisting of parts and assembling departments, to cost more than $75,000 with machinery.

New England Fuel & Transportation Co., 201 River Street, Everett, Mass., will begin work on new coke screening and car-loading plant, to cost more than $75,000 with equipment.

New England Flexible Door Corporation, Winsted, Conn., has been formed to manufacture metal and other doors. Company will be in market for materials and equipment specially constructed for sheet steel press and cut work.

Philadelphia

PHILADELPHIA, Aug. 13.—Conveying, machinery, refrigerating, power and other equipment will be installed in new three and four-story meat packing plant to be built by F. G. Vogt & Sons, Inc., Thirtieth and Race Streets, Philadelphia, to cost about $165,000. C. B. Comstock, 110 West Fortieth Street, New York, is architect and engineer.

Frank M. Cohen, 516 Greenwich Street, Philadelphia, and associates have organized United Machines Corporation, to operate local factory for manufacture of cloth-cutting, pressing and kindred machinery and parts. It is proposed to begin production soon. Albert C. Cohen, 5323 North Mervine Street, will be an official.

Federal Container Co., Fifty-sixth Street and Paschall Avenue, Philadelphia, manufacturer of corrugated and fibreboard containers, recently acquired by Fibre Board Products, Inc., San Francisco, and now operated as unit of that company, has engaged V. D. Simons, 435 North Michigan Avenue, Chicago, mill engineer, to prepare plans for new mill for paperboard and fibreboard production in vicinity of Philadelphia. Initial unit will have capacity of 150 tons per day, and is reported to cost in excess of $650,000 with machinery.

Branch-Crawford Co., 1539 Wood Street, Philadelphia, manufacturer of pipe hangers and other equipment, has awarded general contract to Harry Gill, Jr., 2515 Germantown Avenue, for one-story addition, to cost about $25,000 with equipment. Ballinger Co., Twelfth and Chestnut Streets, is architect and engineer.

Philadelphia Steam Co., Philadelphia, care of Frank M. Hunter, Gibson Building, Chester, Pa., recently organized, has engaged Philip H. Johnson, Widener Building, architect, to prepare plans for central steam plant, to cost more than $2,500,000 with underground piping system.

Board of City Commissioners, Atlantic City, N. J., will establish municipal airport at Bader Field, consisting of two hangars, repair and reconditioning shop, oil storage and distributing plant, to cost about $75,000.

Leeds & Lippincott Co., Atlantic City, N. J., operating Chalfonte-Haddon Hall Hotel, has awarded general contract to Turner Construction Co., Graybar Building, New York, for new six-story automobile service, repair and garage building, and addition to power plant, to cost more than $750,000.

American Ice Co., Broad and Cherry Streets, Philadelphia, will soon take bids for one-story and basement ice-manufacturing plant, 80 x 150 ft., to cost more than $60,000 with equipment.

Harrisburg Gas Co., Harrisburg, Pa., has purchased property, 65 x 265 ft., as site for new equipment storage and distributing plant, with machine and repair division, to cost about $180,000.

Hajoca Corporation, 1136 Ridge Avenue, Philadelphia, manufacturer of plumbing equipment and supplies, has awarded general contract to F. M. Harris & Co., 1520 Parrish Street, for one and two-story factory branch and distributing plant, 50 x 190 ft., at Hazleton, Pa., to include pipe shop and other mechanical departments, to cost in excess of $50,000.

Public Service of Pennsylvania, Inc., Wilkes-Barre, Pa., operating electric light and power properties, is disposing of bond issue of $500,000, a portion of proceeds to be used for extensions and improvements, including transmission line construction.

Traylor Engineering & Mfg. Co., Allentown, Pa., manufacturer of rock-crushing equipment, mining and other machinery, is arranging an expansion and improvement program for a new plant units and machinery to double, approximately, present capacity, reported to cost more than $200,000. Samuel W. Traylor is president.

Pittsburgh

PITTSBURGH, Aug. 13.—Machine tool business is slow in this territory, partly due to the fact that many who direct purchases are away on vacations. Dealers have made prices on a considerable amount of business and expect increased sales when the vacation period ends.

Plans have been authorized by Craig Oil Co., Columbia Bank Building, Pittsburgh, R. T. Craig, president, for extensions and improvements in refinery, including new units and machinery to cost upward of $400,000.

Board of Education, Fulton Building, Pittsburgh, is said to be planning installation of manual training equipment in addition to Baxter Junior High School, to cost about $425,000. Kiehnel, Elliott & Chalfant, 515 Liberty Avenue, are architects.

Allegheny County Steam Heating Co., 435 Sixth Avenue, Pittsburgh, has begun work on new steam power plant for central heating service, to cost about $660,000 with equipment.

Natural Gas Co. of West Virginia, Inc., Farmers' Bank Building, Pittsburgh, is concluding arrangements for purchase of plant and properties of Ohio Fuel & Gas Co., Alliance, Ohio, and vicinity, for $895,000, and plans expansion and improvements, including pipe line construction. George W. Ratcliff is president.

Following acquisition of Kaestner & Hecht Co., 1500 North Branch Street, Chicago, manufacturer of electric elevators, by Westinghouse Electric & Mfg. Co., East Pittsburgh, Kaestner & Hecht name has been changed to Westinghouse Electric Elevator Co. It will be operated as separate unit.

South Atlantic

BALTIMORE, Aug. 13.—Contract has been let by Union Brothers, 37 West Cross Street, Baltimore, manufacturers of furniture, to J. L. Robinson Construction Co., 522 Park Avenue, for one-story addition, 50 x 300 ft., to cost more than $100,000 with machinery. Benjamin Frank, 517 North Charles Street, is architect.

A. S. J. Atkinson, 3801 Macomb Street, N. W., Washington, architect, will soon take bids on general contract for five-story automobile service, repair and garage building, to cost about $110,000 with equipment.

Starlighters Corporation, 735 Sansom Street, Philadelphia, Charles S. Bayer, Jr., president, recently organized, is planning construction and operation of airport in vicinity of Salisbury, Md., including hangars, repair and reconditioning shops, oil storage and distributing buildings, to cost in excess of $80,000.

Tidewater Oil Co., 11 Broadway, New York, will soon begin construction on new oil storage and distributing plant at Baltimore, to cost close to $500,000 with equipment.

Contract has been let by Industrial Rayon Co., Ninety-eighth Street and Walford Avenue, Cleveland, to Fiske-Carter Construction Co., Worcester, Mass., and Greenville, S. C., for new mill at Covington, Va., to include power house, machine shop and other units, entire project to cost in excess of $1,000,000 with machinery.

Atlantic Gas Co., Lewis Building, Philadelphia, has authorized construction of artificial gas plant at Lexington, N. C., to cost upward of $250,000, with 20 miles of piping system. Work will be carried out under supervision of Atlantic Construction & Engineering Co., an affiliated organization.

Standard Looms, Inc., East Spartanburg, S. C., has awarded general contract to Fiske-Carter Construction Co., Worcester, Mass., and Greenville, S. C., for plant to manufacture textile looms and other cotton mill machinery, consisting of one-story foundry, 180 x 350 ft.; one-story assembling plant, 140 x 380 ft.; and main operating unit, 180 x 350 ft. Entire project will cost about $150,000 with equipment. Company was organized recently and has established offices at 519 East Main Street, Spartanburg; Isaac Andrews is president. Lockwood, Greene & Co., Charlotte, N. C., are architects and engineers.

International Harvester Co., Inc., 606 South Michigan Avenue, Chicago, has leased a building to be erected on South Elm Street, Greensboro, N. C., one-story 75 x 142 ft., for factory branch, service and repair building for motor truck division. General contract has been let to Walter Kidde & Co., Jefferson Standard Building, Greensboro.

George W. P. Overman, Norfolk, Va., is at head of project to operate a new plant for manufacture of a life-boat releasing gear. Initial works will be devoted to assembling and it is purposed to have malleable iron castings and other parts made at outside plants.

Twin City Boiler Works, Inc., Bristol, Va., is said to be planning purchase of a splitting shear, rotary type, to handle ¾-in. stock, and auxiliary equipment.

Detroit

DETROIT, Aug. 13.—Former factory of Michigan Furniture Co., Ann Arbor, Mich., has been acquired by Precision Products Co., same city, manufacturer of radio sets and equipment, for expansion. Property totals 40,000 sq. ft. of floor space.

Oldberg Mfg. Co., 2661 West Grand Boulevard, Detroit, manufacturer of automobile parts, is said to be planning one-story addition, to cost more than $30,000 with equipment.

Chevrolet Motor Corporation, 3044 West Grand Boulevard, Detroit, has awarded general contract to Gervais F. Favrot, Balter Building, New Orleans, for one and two-story factory branch and distributing plant at Jefferson Davis Parkway and Venus Street, New Orleans, 122 x 250 ft., to cost in excess of $125,000. Albert Kahn, Marquette Building, Detroit, is architect.

Detroit Casket Co., 2609 Hamilton Avenue, Detroit, will soon take bids on general contract for new one and two-story plant, with boiler house, to cost more than $70,000 including equipment. Christian W. Brandt, 2111 Woodward Avenue, is architect.

Commercial Milling Co., 203 Randolph Street, Detroit, has awarded general contract to Foundation Co., Fulton Building, Pittsburgh, for five-story addition to flour mill, to cost close to $250,000 with equipment.

Briggs Commercial & Development Co., Detroit, has purchased former plant of Rickenbacker Motor Co., Cabot Avenue, and is interested in a company being organized under name of Verville Aircraft Co., to take over and occupy greater portion of plant for manufacture of commercial airplanes and parts.

Wilder-Strong Implement Co., Monroe, Mich., manufacturer of agricultural implements, etc., is said to have plans for one-story addition, to cost in excess of $30,000 with equipment.

Fisher Body Corporation, Detroit, has asked bids on general contract for a one-story addition to automobile body works at Flint, Mich., to be used for pattern shop, die department, and other divisions, to cost about $140,000. Company is said to have plans for another two-story addition at same location, to cost more than $100,000. Albert Kahn, Marquette Building, Detroit, is architect.

Indiana

INDIANAPOLIS, Aug. 13.—Plans are being considered by John Deere Plow Co., 216 South Senate Street, Indianapolis, for new factory branch and distributing plant at Fort Wayne, to cost close to $40,000 with equipment.

Central Indiana Gas Co., Anderson, plans expansion in artificial gas plant, including new holder, with capacity of about 200,000 cu. ft., to cost in excess of $250,000.

Bishop, Knowlton & Carson, 312 North Meridian Street, Indianapolis, architects, have plans for three-story and basement baking plant at Louisville, for company whose name is temporarily withheld, to include ovens, power equipment, conveying and other machinery, to cost close to $300,000.

Laurel Motors Corporation, Anderson, is arranging to specialize in production of airplane motors, and will arrange for parts manufacture and assembling.

Acme Works, Inc., 420 South Harding Street, Indianapolis, manufacturer of aluminum products, has awarded general contract to Robert Berner Co., 401 South Harding Street, for one-story addition, 80 x 136 ft., to cost close to $25,000 with equipment.

Cleveland

CLEVELAND, Aug. 13.—Contract has been let by Ohio Crank Shaft Co., 6600 Clement Avenue, Cleveland, to J. L. Hunting Co., Guarantee Title Building, for one-story machine shop, 80 x 142 ft., to cost about $70,000 with equipment.

Board of Education, Youngstown; has authorized remodeling and improving old Rayen high school for use as a technical and vocational high school, with installation of equipment. S. R. Creps, director, will be in charge and is making estimates of cost.

Dura Co., 1336 West Bancroft Street, Toledo, Ohio, manufacturer of automatic window regulators, etc., has awarded general contract to A. Bentley & Sons Co., Toledo, for new one-story plant, 260 x 500 ft., to cost more than $175,000 with equipment.

Sun Radiator Cover, Inc., Cleveland, has leased portion of building at 7804 Carnegie Avenue, and will establish new plant for manufacture of radiator shields.

Ferro Enameling Co., B. F. Keith Building, Cleveland, metal and steel enameling, has awarded general contract to Kirschner Co., 2725 Pittsburgh Avenue, for two-story and basement addition, 54 x 68 ft., to cost close to $35,000 with equipment.

City Council, Painesville, Ohio, plans early call for bids for equipment for addition to municipal electric light and power plant, to cost in excess of $85,000.

Niles Steel Products Co., Niles, Ohio, is increasing its capital stock from $200,000 to $500,000 and enlarging its capacity one-third for production of steel containers. W. A. Thomas, former president Brier Hill Steel Co., is principal stockholder.

Truscon Steel Co. is centering its pressed steel department in Cleveland, where it purchased, at receiver's sale, plant of Hydraulic Pressed Steel Co. Part of Truscon company's pressed steel sales department has been transferred from Youngstown to Cleveland.

Federal Foundry Supply Co., Cleveland, is erecting new plant at 4600 East Seventy-first Street, Cleveland, part two stories, 90 x 180 ft., and office building, 24 x 120 ft. Machine shop will be 90 x 60 ft., stock room, 90 x 100 ft. and grinding room, 90 x 100 ft. Plant is expected to be in operation Oct. 1.

Transformer division of Packard Electric Co., Warren, Ohio, has been purchased by American Brown Boveri Electric Corporation, Camden, N. J., and manufacturing and engineering facilities will be consolidated with those of purchasing company at Camden. Transformers established under Packard trademark will be continued and coordinated with high-tension, large capacity transformers made by Brown Boveri company. N. A. Wolcott, president of Packard organization, will become associated with Camden company.

Buffalo

BUFFALO, Aug. 13.—Buffalo Tank Corporation, Buffalo, care of Ellis H. Gidley, Marine Trust Building, recently organized with capital of $100,000, will operate local plant for manufacture of steel and galvanized tanks and kindred plate products.

Olean Tile Co., Olean, N. Y., has awarded general contract to A. A. Lane Construction Co., 1869 East Fifty-fifth Street, Cleveland, for three one-story additions, 100 x 105 ft., 50 x 360 ft., and 160 x 260 ft., to cost close to $250,000 with machinery.

George F. Fisk, commissioner of public works, Municipal Building, Buffalo, is asking bids until Sept. 4 for construction of new buildings for New York State College for Teachers, Buffalo, including vocational school, as per plans and specifications on file.

Walter D. Webster, 61 Washington Avenue, and Willis D. Sweet, Jr., 3 Walling Avenue, Oneonta, N. Y., have organized Webster-Sweet, Inc., with capital of $25,000, to operate a local plant for manufacture of engines and parts, and kindred equipment.

Consolidated Aircraft Corporation, Elmwood Avenue, Buffalo, has recently taken over additional buildings adjoining its plant and is carrying out an expansion program. A flying field, with hangar, repair and reconditioning shop and other units, is being established.

Ritter Dental Mfg. Co., Rochester, N. Y., has acquired Electro Dental Mfg. Co., Philadelphia, and will remove company to Rochester as soon as addition can be erected. Extension will be two stories, 60 x 400 ft., and cost $300,000. It is expected to be ready for occupancy Jan. 1. Edward L. Wayman is president and general manager of Ritter company.

Don F. Johnson & Co., Inc., 6 Terrace, Buffalo, has been formed to carry on wholesale hardware and mill supply business in Buffalo district, including Tonawanda, North Tonawanda, Niagara Falls, Lockport, Batavia and Jamestown. It will represent E. C. Atkins & Co., Inc., Indianapolis, hack saws, band saws and files; Buckeye Twist Drill Co., Alliance, Ohio, drills and reamers; Gardner Tap & Die Co., Marion, Ohio, taps and dies; Hisey-Wolf Machine Co., Cincinnati, electric drills, grinders and buffers, and Union Mfg. Co., New Britain, Conn., chucks and hoists. Don F. Johnson, recently president Duroflex Corporation, Buffalo, is president of new company.

Chicago

CHICAGO, Aug. 13.—Fresh inquiry for machine tools is in smaller volume and dealers are concentrating on prospective business which developed prior to this month. Small industrial buyers who want standard tools are fairly active, but in many cases are not satisfied with promises of delivery.

Railroad business is confined to miscellaneous inquiries. The Santa Fe will buy a spring banding press, and the Chicago, Milwaukee, St. Paul & Pacific will take prices on a frog and switch planer. The Burlington will purchase an 18-in. lathe, and the Rock Island is interested in a 48-in. radial drill. Quotations have been submitted on machine tools that will be purchased by A. O. Smith Corporation, Milwaukee.

Interstate Iron & Steel Co., 104 South Michigan Avenue, Chicago, will build a three-story transformer station, 50 x 83 ft., to cost $18,000.

Cameron Can Machinery Co. 140 North Ashland Avenue, Chicago, will build an addition, 98 x 216 ft., to cost $100,000.

Moline Iron Works, Moline, Ill., has been granted a permit to erect an addition.

Contract has been let by Emerson-Brantingham Co., South Independence Avenue, Rockford, Ill., manufacturer of agricultural implements to Security Building Co., 1016 Charles Street, for one-story addition, 120 x 215 ft., to cost close to $100,000 with equipment.

Quaker Oats Co., 80 East Jackson Boulevard, Chicago, has awarded general contract to Leonard Construction Co., 37 South Wabash Avenue, for multi-story mill and distributing plant at Cedar Rapids, Iowa, 85 x 115 ft., to cost more than $300,000 with equipment.

Chicago Printed String Co., 2411 Clybourn Avenue, Chicago, manufacturer of adhesive paper tape and kindred products, is having plans drawn for a two-story and basement plant, 85 x 125 ft., to cost about $175,000 with equipment. Alfred S. Alschuler, 53 West Jackson Boulevard, is architect.

Standard Oil Co., 910 South Michigan Avenue, Chicago, has awarded general contract to Kaiser-Duett Co., Rialto Square Building, Joliet, Ill., for one and two-story storage and distributing plant, with boiler house and automobile service, repair and garage building at Joliet, to cost upward of $100,000 with equipment.

Community Motors, Inc., 235 East Thirty-third Street, Chicago, has filed plans for two-story service, repair and garage building, 130 x 175 ft., to cost in excess of $250,000 with equipment.

Victor Mfg. & Gasket Co., 5750 Roosevelt Road, Chicago, manufacturer of gaskets and other power equipment, is completing plans for four-story addition, 100 x 160 ft., to cost $150,000 with equipment. Frank D. Chase, Inc., 720 North Michigan Boulevard, is architect and engineer.

Gulf States

BIRMINGHAM, Aug. 13.—Bids will soon be asked by Texas-Louisiana Power Co., Fort Worth, Tex., for new steam-operated electric generating plant at Olney, Tex., to cost in excess of $150,000 with transmission system.

Ovens, power equipment, conveying and other machinery will be installed in new two-story plant at East Dallas, Tex., to be erected by Baird Baking Co., Fort Worth, Tex., to cost about $160,000 with equipment.

Wilson & Toomer Fertilizer Co., West Bay Street, Jacksonville, Fla., is planning one-story addition, 200 x 500 ft., to cost close to $100,000 with machinery.

City Council, Oxford, Miss., is said to be planning early purchase of one 2-ton electric traveling crane for installation in municipal power plant, for which plans have been drawn by Frank P. Gates, Edwards Hotel Building, Jackson, Miss., architect.

Board of Education, Corpus Christi, Tex., plans installation of manual training equipment in new three-story high school to cost about $275,000, for which superstructure will soon be placed under way. G. P. Blevins is secretary in charge.

C. A. Parker, 533 Vine Street, Shreveport, La., and associates have awarded general contract to H. C. Bellows, 208 Edwards Street, for new three-story automobile service, repair and garage building to cost approximately $130,000, with equipment.

City Council, Amarillo, Tex., is planning fund of $45,000 for establishment of municipal airport, including hangar, 80 x 100 ft., machine and repair shops and other buildings. It is understood that company to be known as Amarillo Airport Corporation will be organized to carry out project. J. D. Bartlett is city manager, in charge.

Florida Container Co., Tampa, Fla., care of John T. Ladue and T. M. Schackleford, 933 Golf View Avenue, recently organized, has acquired property on Mississippi Avenue and plans early establishment of new plant for manufacture of corrugated and fiberboard containers.

United States Bureau of Mines, Department of Commerce, Washington, has awarded contract to James T. Taylor, Fort Worth, Tex., for new helium gas plant at Stoncy, near Amarillo, Tex., to cost about $500,000 with machinery.

Firestone Tire & Rubber Co., Akron, Ohio, has plans for new factory branch and distributing plant at Jacksonville, Fla., to cost more than $300,000 with equipment.

Magnolia Petroleum Co., Dallas, Tex., has acquired tract of 600 acres adjoining storage and distributing plant at Midland, Tex., and plans early construction of additional units to cost more than $250,000.

Lato Steel Mfg. Co., Texarkana, Ark.-Tex., has been incorporated to manufacture metal screens. It has purchased plant and patent rights of Delmar D. Pinkham and expects to develop this bus-

iness, adding other lines used in building operations and made from sheet metal. Later company expects to engage in fabrication of steel. J. K. Wadley is president of company.

Cincinnati

CINCINNATI, Aug. 13.—Although there has been a slight recession in machine tool buying since the first of the month, local builders are agreed that this is the best summer in several years, so far as bookings are concerned. Manufacturers are somewhat surprised at the level at which business has been sustained in the past 60 days, a level which is regarded as eminently satisfactory. Operations of Cincinnati machine tool plants are being carried along far above normal for the July-August period and no slackening of production is in sight. The large number of sources of current business is indicative of the widespread demand for new equipment among consuming industries.

American Car & Fouundry Co. has bought a 48-in. car-wheel borer for installation at its Berwick, Pa., works, and A. S. Cameron Pump Works, Philipsburg, N. J., has purchased two 6-ft. right-line radial drills.

Bids will soon be asked on general contract by Ohio Valley Oxygen Co., 942 Kenyon Street, Cincinnati, manufacturer of industrial oxygen, etc., for one-story addition, to cost approximately $35,000 with equipment. J. G. Steinkamp, Mercantile Library Building, is architect.

W. A. Cluff, chairman of board of trustees, State Normal College, Columbus, Ohio, is asking bids until Aug. 31 for extensions and improvements in power house at institution at Kent, Ohio, to cost approximately $75,000, including new steam lines, tunnel, etc. Ronan & Englesson, 1694 North High Street, Columbus, are architects.

Ohio Fuel Gas Co., 99 North Front Street, Columbus, Ohio, has filed plans for two-story automobile service, repair and garage building, with equipment storage and distributing facilities, to cost about $130,000 with equipment. E. C. Ramsey is in charge.

Federal Public Service Co., operating Crystal Ice & Cold Storage Co., Twenty-second Street and Central Avenue, Ashland, Ky., recently acquired, is reported planning new cold storage and refrigerating plant unit on adjoining site, to cost in excess of $150,000 with machinery.

F. L. Saino Mfg. Co., 66 West Colorado Street, Memphis, Tenn., manufacturer of fire doors and other fireproof building products, is said to be planning an expansion and improvement program. Company recently arranged for increase in capital.

Springfield Metallic Casket Co., North Street, Springfield, Ohio, is said to be arranging early call for bids for addition to cost upward of $175,000, for which plans are being drawn by Eastman & Budke, First National Bank Building, architect.

Aluminum Industries Corporation, 2416 Beekman Street, Cincinnati, has awarded general contract to H. C. Hazen, Cincinnati, for a one-story foundry, to cost close to $20,000 with equipment.

Regan & Weiler, Dermon Building, Memphis, Tenn., architects, have completed plans for new three-story boys' high school, with manual training facilities, to cost about $260,000, for which superstructure will soon begin.

Milwaukee

MILWAUKEE, Aug. 13. — Machine-tool builders describe the situation as satisfactory, all things considered. Production is well sustained and some shops are on overtime schedules to keep deliveries within specifications. The bulk of business consists of single tools, with here and there a small lot order. The volume of inquiry received is taken to forecast favorable business. On the whole, this is the best summer season most tool builders have experienced in a number of years.

Wisconsin-Michigan Power Co., 112 East College Avenue, Appleton, Wis., has purchased 17,000 acres along both banks of the Sturgeon River, in Baraga County, Mich., and is undertaking a $3,000,000 hydroelectric generating project covering three years. E. H. Schnidman is hydraulic engineer. D. K. Ellis, Appleton, is vice-president and general manager.

Hill-Hubbel Co., San Francisco, has leased former Kidwell Boiler Mfg. Co. plant at Thirty-second and Hopkins Streets, Milwaukee, for protective processing a welded steel pipe manufactured by A. O. Smith Corporation for a 350-mile pipe line for Texas Pipe Line Co. San Francisco company has developed an automatic system of covering pipe with asphalt and felt paper. Quarters in former Kidwell plant are only temporary, Hill-Hubbel Co. planning construction of a new shop in closer proximity to Smith plant. New plants also are to be established at Indiana Harbor, Ind., and Youngstown. Machinery for these branches is being built in Milwaukee shop. Herman Kramer is general superintendent.

Wisconsin Parts Co., 571 High Street, Oshkosh, Wis., manufacturer of axles and gears for heavy duty motor vehicles, is erecting two-story office building, 40 x 70 ft., and a one-story shop extension. Present office space will be converted into shop quarters. Tooling also will be materially increased.

Gunderman Motor Sales Co., 399 Fifty-first Avenue, West Allis, Milwaukee, is enlarging its service shop by an addition, 40 x 60 ft.

W. Clasmann Co., Milwaukee, has been incorporated to furnish sales and engineering service for industrial and mechanical equipment manufacturers. Headquarters are at 120 East Wisconsin Avenue. Principals are Fred W. and John W. Clasmann.

St. Louis

ST. LOUIS, Aug. 13.—Plans are being considered by Missouri Pacific Railroad Co., Missouri Pacific Building, St. Louis, for new car and locomotive repair shops at Nettleton, Mo., to cost in excess of $100,000 with equipment. E. A. Hadley is chief engineer.

Pine Bluff Cotton Oil Mill, Pine Bluff, Ark., has arranged an expansion and improvement program to cost about $50,000, including installation of two cotton oil presses and auxiliary equipment.

Cities Service Gas Co., Wichita, Kan., operated by Cities Service Co., 60 Wall Street, New York, has plans for new 16-in. pipe line for natural gas service from Ottawa and Kansas City, Kan. Company will also make extensions in gas compressor stations at Mooreland, Okla., and at points on Wichita-Pampa, Tex., line, and new 5000-hp. compressor units will be built at Corwin, Kan., and Higgins, Tex.

Tulsa Airport Corporation, Tulsa, Okla., has awarded general contract to B. Russell Shaw Co., 810 Olive Street, St. Louis, for complete airport, including hangars, machine and repair shops, oil storage and distributing building, control tower and other units.

Wetherell Motor Co., Twentieth and Harney Streets, Omaha, Neb., W. H. Wetherell, head, has leased new three-story and basement building, 146 x 200 ft., to be erected at Twentieth and Dodge Streets, for new service, repair and garage unit, to cost about $160,000 with equipment. Harvey C. Peterson, Bankers Reserve Life Building, is architect.

Page Milk Co., Merrill, Wis., plans construction of power house and machine shop at new milk condensary at Marshall, Mo.; will also install can department, with conveying and other handling equipment. Entire project will cost in excess of $200,000.

Oklahoma Steel Castings Co., Tulsa, Okla., has placed contract with Industrial Construction Co., Tulsa, for 50 x 50 ft. extension to finishing department and has purchased following equipment: Five-ton, overhead electric traveling crane from Shepard Electric Crane & Hoist Co.; 1-ton, gas fired, automatic temperature control annealing oven from Mahr Mfg. Co.; electric control mechanism from Brown Instrument Co., and rotary table sand blast room and complete dust arrester equipment, from Pangborn Corporation.

Sterling Machinery Corporation, 2307 Holmes Street, Kansas City, Mo., has been formed to manufacture electric and gasoline driven hoists. Contract for iron and semi-steel castings has been awarded to Kansas City Hay Press Foundry and machine work contract has been let to Schroer Brothers, Inc.

Pacific Coast

SAN FRANCISCO, Aug. 8.—Plans are being arranged by California Wire & Cable Co., Orange, Cal., for one-story addition, to cost close to $80,000 with equipment.

Pacific Coast Pulp & Paper Co., Los Angeles, care of C. A. Kieren, Hotel Clunie, Sacramento, Cal., superintendent, recently organized, is taking bids on general contract for one, two and three-story mill at Richvale, Cal., with machine shop and miscellaneous units, to cost about $900,000 with machinery. Peter Swan, Lewis Building, Portland, is engineer.

Morgan, Walls & Clements, Van Nuys Building, Los Angeles, architects, are completing plans for three-story and basement automobile service, repair and garage building, 60 x 150 ft., to cost in excess of $120,000 with equipment.

Board of Education, Los Angeles, will soon begin work on one-story addition to manual training shop at David Starr Jordan High School, to cost about $38,000. William A. Sheldon, Chamber of Commerce Building, secretary, in charge.

Coal Products Corporation, North Bend, Ore., is planning construction of one-story coal reducing, pulverizing and by-products plant on waterfront, 60 x 600 ft., to cost $300,000 with equipment. Clyde M. Clefton is secretary.

Texas Oil Co., Yeon Building, Portland, has plans for oil storage and distributing plant on waterfront property, to cost in excess of $350,000 with equipment. Entire project will include marine terminal facilities for oil handling and shipping.

and will cost upward of $750,000. L. M. McCray is district manager.

Municipal Bureau of Supplies, San Francisco, is planning construction of storage and distributing plant, with repair department, to cost $250,000 with conveying and other material-handling equipment.

California Sprayer Co., 6001 Pasadena Avenue, Los Angeles, manufacturer of spraying equipment, has plans for a two-story addition, 60 x 96 ft., to cost about $20,000. Loy L. Smith, 1506 West Forty-sixth Street, is architect.

Canada

TORONTO, Aug. 13.—Demand for machine tools continues at a high level, and indications are that August business will equal that of any former month this year. While most of the business is for single tools, inquiry is coming out for complete equipment for industrial plants now under construction.

The Dominion Department of Railways and Canals, Ottawa, has awarded contract for operating machinery and electrical equipment for lock gates, taintor valves, regulating weirs and gateyard for the Welland Canal to the Montreal Locomotive Works, Ltd., 145 St. James Street. Several other large contracts for equipment for new plants and electrical works, etc., have recently been closed and others are pending.

Canadian National Electric Railways, Toronto, have awarded contract to Bathe & McLelland, 17 Yonge Street, for construction of car house, sub-station, etc., at North Oshawa freight terminal to cost $150,000.

Service Station Equipment Co., Ltd., 510 King Street East, Toronto, has awarded contract for new one-story factory, 100 x 400 ft. Machinery and tools will be purchased later.

Dominion Bridge Co., Redford Building, Toronto, has awarded contract to Dickie Construction Co., 17 Yorkville Avenue, for an addition to cost $85,000.

General Metal Devices, Ltd., Oakville, Ont., has awarded contract to W. W. King for a factory to cost $20,000. R. Card, 142 Chester Avenue, Toronto, is architect. Building will be one story, 60 x 300 ft.

Gilmour Chair, Ltd., Coaticook, Que., has awarded contract to Stewart Construction Co., Ltd., 12 Wellington Street North, Sherbrooke, Que., for a factory to cost $80,000. It will be in three units each one story, 80 x 400 ft., 20 x 50 ft., and 56 x 109 ft. Ewart, Armer & Bryan, Jackson Building, Ottawa, are architects.

North Shore Power Co., Ltd., Des Forges Street, Three Rivers, Que., will build a $50,000 addition to its plant.

F. A. Dallyn, 71 King Street West, Toronto, Ont., has plans for a filtration plant and power house in Queen Victoria Park, Dufferin Island, Niagara Falls, Ont., for Niagara Falls Water Commission, to cost $500,000.

Sawmill owned by Hawkesbury Lumber Co., Hawkesbury, Ont., was destroyed by fire Aug. 9, with a loss estimated at $200,000. Owner will rebuild immediately and will be in market for necessary equipment.

Foreign

PLANS have been approved by Eisen and Stahlwerke Aktiengellschaft, Dortmund, Germany, manufacturer of iron and steel products, for an addition to be equipped in part as rolling mill for aluminum and other metals, and for metal plating. It is purposed to have the unit ready late in fall.

Colombian Ministry of Public Works, Bogota, Colombia, is asking bids until Sept. 10 for one 20-ton overhead electric traveling crane.

Electroplan of Soviet Russian Government, Moscow, has authorized plans for a steam-operated electric generating plant in Bobrikovsk district, Tula Province, about 140 miles from Moscow, to be developed as largest station of type in that country. Site is located in coal district and mining properties will be developed for fuel supply. Entire plant will have capacity of 300,000 kw. and is estimated to cost more than $100,000,000. American-Russian Chamber of Commerce, 145 West Fifty-seventh Street, New York, has information on project.

State Electricity Commission of Victoria, Melbourne, Australia, will receive bids until Oct. 31 for watertube boilers and complete accessory equipment, as per plans and specifications on file, also available at office of Agent General for Victoria, Victoria House, Melbourne Place, Strand, London, England.

Minister of Interior, Asuncion, Paraguay, will ask tenders soon for a complete waterworks and sewage system for city, to cost about 4,560,000 Argentine gold pesos (about $4,377,600), including power equipment, pumping machinery and other apparatus. Information at office of Bureau of Foreign and Domestic Commerce, Washington, reference Paraguay No. 283379.

Mexican Eagle Oil Co., Mexico City, Mexico, is planning extensions and improvements in refinery at Minatitlan to double the present capacity, including construction of pipe line from new oil fields recently developed on Isthmus of Tehuantepec, with compressor stations, etc., to furnish additional supply of crude oil to refinery. Entire project will cost close to 6,000,000 pesos ($3,000,000).

New Trade Publications

Air Hammers.—Union Iron Works, Hoboken, N. J. Bulletin 104 of 8 pages illustrates and describes a line of hammers designed primarily for construction work and particularly for driving sheet and piles. Those for sheeting weigh 97 and 220 lb. in the two sizes here featured, while the pile-driving hammers run up to a maximum of 21,000 lb., striking a blow of 17,815 lb.

Coal Cleaning.—"Stabilization of the Coal Industry and the Sand Flotation Process," H. M. Chance & Co., 943 Drexel Building, Philadelphia. Describes the various principles of coal washing, including flotation of coal in a water-sand sludge. The latter process is said to be installed in 25 plants with combined annual capacity of 10,000,000 tons.

Carburizing Furnaces.—American Gas Furnace Co., Elizabeth, N. J. Bulletin 12-A, showing rotary retort carburizing machines and stationary vertical retorts, the latter using gas as the carburizing agent. Both types of furnaces can be used for other purposes, such as annealing, rehardening, nitrogen hardening, and bright annealing in hydrogen.

1928-1929 Calendar.—David Bell Co., Buffalo. Calendar from August, 1928, to July, 1929, inclusive, featuring illustration of the Liberty Bell and the first note struck on it.

Refractory Materials. — Bolckow, Vaughan & Co., Ltd., Middlesbrough, England. Booklet describing silica and fireclay refractory products. Analyses and various uses of different products are included together with illustrations of typical installations.

Solder.—J. Linn Johnson Mfg. Co., Wilkes-Barre, Pa. Leaflet dealing with solder for iron and steel castings, etc., which may be applied without soldering iron and hardens immediately.

Steel Windows.—Bogert & Carlough Co., Paterson, N. J. Catalog J-28, describing Boca projected steel windows with emphasis on bronze ventilator guide, which is special feature. Specifications, detail drawings and complete data for architect or engineer are included.

Building Products.—Milwaukee Corrugating Co., Milwaukee. Catalog 20-E, being a data book on materials and methods on building products. Engineering tables on reinforced concrete construction are included, together with details, specifications and general information regarding expanded metal lath, expansion corner bead and casings, interior metal trim, steel domes, channels and other firesafe building products.

Bolt Clippers and Cutters.—H. K. Porter, Inc., Everett, Mass. Catalog containing detailed information and specifications of bolt clippers and wire, nut, chain, bench and special cutters. There are diagrams showing capacities of tools and jaw openings and nearly every kind of jaw made for bolt clipper handles is included.

Superheaters.—Superheater Co., 17 East Forty-second Street, New York. Catalog devoted to the Elesco superheater for power plants. Various phases of superheat are discussed and there are illustrations and explanations of many types of boilers so equipped.

Tool Steels.—Poldi Steel Corporation of America, New York. Leaflet devoted to the uses of the various specialized tool steels manufactured by Poldi Steel Works, Prague, Czechoslovakia. High speed, carbon, alloy and special steels are included.

Unit Heaters.—Skinner Brothers Mfg. Co., Inc., Elizabeth, N. J. Engineering data book giving details of unit heaters for various types of industrial buildings.

Baling Presses.—Logemann Brothers Co., Milwaukee. Leaflet describing Logemann toggle lever type baling and scrap metal presses with belt or direct motor drive.

Condulets.—Crouse-Hinds Co., Syracuse, N. Y. Bulletin 2112 dealing with condulets for railroad mail car lighting and fan installations. Full specifications and diagrams of lighting systems are included.

Resistance Thermometers. — Brown Instrument Co., Philadelphia. Catalog 93, containing detailed information about resistance thermometers for indicating, recording and controlling and for measuring temperatures from 300 to 1000 deg. Fahr. Full descriptions of applications to modern industrial uses are included.